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"Our early expectations [for the success of OS/2] were incorrect; we did not do ourselves or the industry a service by setting those expectations."

PAUL MARITZ
MICROSOFT CORP.

On the status of OS/2
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EXECUTIVE BRIEFING

■ The two giant independent software vendors separately mapped out their strategies for the '90s. In a plan to be formally revealed today, CA expects to integrate its diverse family of acquired products on the standard architectures of IBM's SAA and DEC's NAS, through shared services. Page 1. D&B Software Chairman John Imley assured 5,000 MSA user group conference attendees that the merged firm will maintain both MSA and M&D product lines. However, M&D users remain skeptical about merger benefits. Page 4.

■ When firms join forces with outside partners, the lines between them can blur and so can the role of IS. An example is Corning Glass, where strategic alliances and joint ventures have changed IS from an in-house operation to a service organization that provides IS services to some joint-venture companies and buys IS services from others. One expert says U.S. firms fail to recognize the importance of information-sharing in alliances and adds they should learn by watching foreign counterparts. Page 75.

■ Computer leasing industry turmoil continued as Atlantic PLC, the world's third-largest lessor, went into receivership in the UK. Page 99. U.S. subsidiary Atlantic Computer Systems slashed more than 80% of its staff and fired its president, while Atlantic customers risk costly problems if some of Atlantic's unusual leasing contracts do not hold up in bankruptcy court. Page 1.

■ AS/400 mentor Stephen Schwartz moved up a notch in the IBM pecking order, becoming one of eight vice-presidents reporting directly to Chairman John Akers. Sales veteran Robert LaBant replaced Schwartz as head of midrange systems. Page 6.

■ On-site this week: An HP 3000 minicomputer and CD-ROM storage are the definitive solutions at Merriam-Webster, the 159-year-old dictionary publishing firm. The firm plans to transfer 14 million definitions to CD-ROM media by the end of this year. Page 35.

■ A third-party maintenance firm won an antitrust lawsuit against HP. Cleveland-based Hypoint charged that HP used its monopoly position to make changes in service policies that cut into Hypoint's business. Hypoint won damages of \$500,000, which may be trebled, but HP will try to overturn the verdict or appeal. Page 4.

■ Canadian utility Ontario Hydro is the latest user of an FDDI backbone network supporting Ethernet. The utility's research division went from virtually no networking capability to become what is possibly Canada's first major fiber-based network installation. Page 8.

SAI's data terminals to send orders to the kitchen. Page 55.

From Total Customer Service by William Davidow and Bro Uttal: "Business economics over the last two decades have forced a change in managerial thinking that is undermining customer service in subtle, pernicious ways. Battered by high inflation in the late 1970s, fierce competition from foreign companies in the 1980s and the continuing threat of being taken over by raiders, many managers have accepted a new philosophy. More than ever, they want to cut costs and turn out strong short-term financial results. . . . Customer service is a favorite victim because many of the activities that produce service seem extraneous and returns to spending on service tend to accrue over the long term."

Don't write off the mainframe yet! Its muscle will be at the core of a distributed future. Page 31.



Want a solid step? Fix it before things break. Page 87.

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Synon tapped for AD/Cycle team

BY MARYFRAN JOHNSON
C/STAFF

In a move reassuring to some customers yet surprising to industry analysts, IBM announced a California-based software vendor last week to provide the native application generators for the Application System/400 mid-range computers.

Synon, Inc., in Larkspur, Calif., joined a trio of third-party vendors that share development data with IBM as business partners in AD/Cycle, the application development framework under IBM's Systems Application Architecture (SAA).

With 1,500 customer sites in the U.S., Synon sells an interactive computer-aided software engineering (CASE) development package called Synon/2E. The product designs, codes, documents and maintains applications and generates native AS/400 source code in the RPG and Cobol languages.

Earlier this month, Synon introduced its AD/Cycle Interface, a bridging tool that allows users to integrate Synon/2E with CASE tools from the other three AD/Cycle partners — Bachman Information Systems, Inc., Intel Technology Corp. and Knowledgeware, Inc.

Yet the news of Synon's selection was disconcerting to industry watchers who believed IBM would provide its own application generator on the mid-range through Cross System Product (CSP), a fourth-generation language and collection of enhanced application design tools.

"This may be good news for the AS/400, but it detracts from the AD/Cycle vision of a single application, language and method," said Adam Rin, an analyst at Gartner Group, Inc. in Stamford, Conn. "This is a concession by IBM that it would take CSP a long time to get to the AS/400."

An IBM spokesman said last

week that the company never intended to provide its own application generator piece of CSP on the midrange but will eventually provide AS/400 users with a CSP/Application Execution tool, a runtime component necessary to execute CSP applications developed on IBM workstation platforms.

"I think [the choice of Synon] is a case of IBM recognizing they don't have the resources to do everything, and they needed some firm rooted in the AS/400," said Paul Pavloff, senior director of information resources at Georgia-Pacific Co. in Atlanta.

Welcome relief

For users such as Gibbs Vandercook, senior manager of the advanced technology group at Ernest & Young in Chicago, the Synon choice was a welcome relief.

"This moves us one step closer to that seamless environment

we hope to ultimately get," he said. Vandercook is using CASE tools from Knowledgeware and Synon to build an on-line interactive program for a business client who will eventually distribute the application code to more than 1,400 machines.

Developers doing planning and analysis work in Knowledgeware's Information Engineering Workshop can now — using the Synon interface — move their front-end work from an IBM workstation into the Synon/2E application generator on the AS/400. The same holds true for Bachman's re-engineering products and Index's Accelerator series.

"The big advantage is having greater integration between my two activities," said Vandercook, who is the first user of Synon's AD/Cycle Interface. "In the past, you had to build your own tools to bridge over to the application generator and run the risk of somebody corrupting the information."

The Synon interface allows users to import IBM's External Source Format (ESF) descrip-

tions from software products developed by the other AD/Cycle vendors.

ESF is a licensed IBM language that allows front-end tools to talk to CSP products. It is considered the first step toward IBM's long-awaited repository, where different software-building tools can store and interchange information.

Synon President Chris Heron said the company will replace its current tool repository with the IBM repository when it becomes available for the AS/400 in about two years.

However, the additional cost of replacing the Synon tool repository will be borne mainly by the customers, said Mike Hansen, who is director of information systems at Chemical Waste Management Corp. in Oak Brook, Ill.

"We do plan to migrate, but we expect Synon and IBM to come up with some of the cost to be the customer move," Hansen said. "In reality, none of us really knows where the AS/400s play or what IBM's plan is with SAA."

CA

FROM PAGE 1

that really does transcend hardware environments makes a lot of sense," said Vaughan Merlyn, chairman of CA's Research Corp. in Bellevue, Wash. CA has "a better shot than anyone to do this."

George Emmanuel, manager of manufacturing and database systems at Hughes Aircraft Co. and secretary/treasurer of the IDMS User Association, was optimistic. "CA may have six schedulers and multiple databases," but the products will evolve to similar technology with future releases, he said. "The services, interfaces and user contact with software will become more and more indistinguishable."

In an interview with *Computerworld* last week, CA executives said that many pieces of the architecture are in place today. However, just when and how customers may take advantage of the CA '90s vision remains hazy.

"From a technology perspective, it is real," said Bryan Shepherd, executive vice-president of marketing at CA. "Not every product uses all the services, but our commitment is to expand that to all products."

Shepherd claimed that 75% of CA's IBM MVS products currently use CA '90s services. However, other environments are further away from that nirvana. Shepherd said CA has been at work porting products to the personal computer and DEC VAX environments and acknowledged that Unix remains a

"missing piece."

Specifically, CA pointed to the following areas in which customers can start using CA '90s today:

- A single point of communications between applications is already used by many security and systems software products in the MVS, VSE and DEC environments, according to CA.
- Database services across multiple platforms. CA offers at least three database management sys-

IBM's and DEC's.

Security products have a generic interface layer. CA said it has been implementing single-point sign-on for security products for over a year.

Distributed processing across CPUs is possible today using CA's Diastem DB-Star, according to CA, and local-area networks are supported by IDMS/PC.

CA said that it is progressively moving functionality into all of its products and that to reap the

Akers beckons Schwartz into IBM inner sanctum

BY MARYFRAN JOHNSON
C/STAFF

ARMONK, N.Y. — IBM Chairman John Akers added another face to his inner circle last week with the appointment of Stephen Schwartz, the senior executive responsible for the successful rollout of the Application System/400 midrange computer line.

Although industry analysts were a bit mystified by Schwartz's unusual appointment, the new title — IBM vice-president of market-driven quality — the company characterized the move as evidence of its intent to cut back on bureaucracy and guarantee "total customer satisfaction and zero defects" in IBM products.

It was unclear last week what sort of power Schwartz will hold in his new position because no staff, budget or location has been assigned to him yet. He is now the eighth vice-president reporting directly to Akers.

Replacing Schwartz as vice-president of Application Business Systems in Robert J. LaBatt's former general manager of market operations for IBM's U.S. Marketing and Service Division.

"Now that the rollout of the AS/400 is over, it's a time for someone to keep pushing the

thing," said Robert Djurdjevic, president of Anner Research in Phoenix. "Bob LaBatt was well-respected as an aggressive salesperson."

Djurdjevic said Schwartz's market-driven quality title was formerly held by the director level, a management tier that ranks lower in IBM's company structure. "The job was elevated to go with Schwartz, not the other way around," he said. "But I think Schwartz will be well-suited to a special project like this — to get things moving within the bowels of IBM."

"If a problem got to Schwartz, he would generally assign it to someone to follow up with action rather quickly," agreed Paul Pavloff, senior director of information resources at Georgia-Pacific Co. in Atlanta, one of the AS/400 system's largest customers.

Sam Albert, a former IBM executive turned consultant, said Schwartz has a reputation within IBM of candor and integrity. "IBM is very adroit at transferring skills that round out their customer," Albert said. "LaBatt has never been a developer, but he is clearly a leader. The strength he'll bring to the development organization is the customer viewpoint and perspective."

Ring around the enterprise

CA's computing architecture envisions a ring of programming services common to all applications used in an enterprise



Source: Computer Associates International, Inc.

CW Chart: John Nork

tem products but maintains that standard SQL and a generic interface layer will make the underlying database engine, whether CA's or IBM's, irrelevant.

Repository services, such as DBMSs, are currently provided by various data dictionary products on different platforms. Similarly, CA claims all of its applications will interface with its own repository services as well as

benefits of CA '90s, in most cases, the latest versions will be required. Customer migration to its architecture will vary on a case-by-case basis, the company said, depending on the products used.

Many users and analysts trumpeted the announcement as a sign of a new, more open CA. For its part, CA said the timing was right to share its master plan.



IBM's Schwartz led AS/400 rollout

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NEWS SHORTS

IBM releases 4 upgrade paths

IBM is announcing its plans to upgrade existing to its midrange systems, the GS/4 family. Last week, a company spokesman said that the 4 upgrade paths would be available only. The company will also stop giving 3-to-3 upgrades to new model users at that time. Mainframe users have had to wait months to upgrade last year, while 4 and 5 models are still officially available. IBM continues to make these last alternative deals. This is particularly true with the 5 model, which had a brief lifetime served by technical glitches and delays.

Price cuts for Mac portables

Prices on Apple Computer, Inc.'s 7-month-old portable Macintosh have been lowered by \$1,000, and memory prices went cut between 16% and 23%. Users have complained about the computer's price, although Apple said it has been well-received. Before the reduction, the computer, with 1M byte of memory, was \$6,799; most portables are in the \$4,000 range.

Hitachi will go fault-tolerant

Hitachi Ltd. said it will introduce the first fault-tolerant system made by a Japanese firm in the fall. The machines will range in price from \$63,700 to \$1.9 million. Fujitsu Ltd. and NEC Corp. are also said to be developing fault-tolerant systems, but the Japanese market is currently dominated by two U.S. vendors: Stratus Computer, Inc. and Tandem Computers, Inc.

Focus tools for VAX

Information Builders, Inc. (IBI) has introduced FocusMail, a menu-driven auditing tool designed to run on Digital Equipment Corp.'s VAX/VMS systems. The program, written in IBI's Focus fourth-generation language, features automatic auditing functions such as analyzing fields, compiling and validating data, testing and converting dates and the production of statistical summaries and exception reports.

HP sends 782 into retirement

Nearly one-third of the eligible employees took Hewlett-Packard Co. up on its early retirement offer, which was aimed at cutting expenses. The offer was made in June to employees who had been at HP for more than 15 years and who were at least 55 years old. About 2,400 employees were eligible and 782 took retirement, about what the company expected. Analysts said that this is one way for HP to trade higher paid employees for a younger, leaner and cheaper work force.

Carriers display virtual net

U.S. Sprint Communications Co. and Cable & Wireless PLC last week announced Global Virtual Private Network, the first trial of an agreement the carriers signed last year to provide international network offerings. Global VPN, slated to be available in September, is said to provide management and other features associated with dedicated networks over a switched digital system. A similar offering called VPN+ is introduced by international carrier Inland last month. Also last week, Sprint announced a commercial service said to allow users of its System 400 electronic mail service to exchange mail with the Internet system, using the CCITT X.400 standard.

Wang enhances IBM links

Wang Laboratories, Inc. boosted connectivity between its VS minicomputers and IBM mainframes last week with the announcement of enhancements to its Information Distribution System (IDS) products. IDS Release 3.0 now allows customers to implement IDS across both private and public packet-switched networks by supporting IBM's Systems Network Architecture communications over X.25 transports, as well as IBM's Synchronous Data Link Control. Upgraded network administrator and management controls were also included in the enhanced IDS products.

More news shorts on page 120

FDDI descends on Canada utility

BY JOANNE M. WEXLER
CHICAGO

In one fell swoop, the research division of Canadian electric utility Ontario Hydro has transformed a virtually nonexistent free environment into a state-of-the-art FDDI metropolitan-area backbone.

The company said last week that it has possibly become Canada's first Fiber Distributed Data Interface (FDDI) user by virtue of four Fibronics International, Inc. FXS210 Ethernet-to-FDDI bridges linking four new Ethernet local-area networks to the 100M bit/sec. fiber ring. The extended network was installed by network integrator Lanstar.

The new network will initially support 300 to 500 nodes, according to Neville Pereira, Ontario Hydro's integrated computing environment supervisor.

Pereira added that the University of Toronto, which is providing 20 network nodes to the research division, has a Cray Research, Inc. supercomputer that his company would like to access to aid in its research work. The university is across the street from Ontario Hydro's headquarters, and all three sites will link

to the backbone via Fibronics bridges and FXS410 distance extenders.

Pereira said the FDDI network will eventually connect to the corporate network, which supports about 10,000 nodes scattered throughout Ontario.

Pereira said network evaluations have been under way at his company for several years. The Ethernet-FDDI scenario allows users to share expensive peripherals, gain access to corporate and outside resources and compete more ably for consulting projects assigned by the Electrical Power Research Institute, a utility consortium.

He added, "We'll be able to transfer large amounts of data to people in the power generation facilities who can diagnose and solve problems, which should ultimately benefit customers."

Ontario Hydro anticipates a change in its working environment resulting from the advent of electronic mail, shared software applications and network

access from remote locations, according to Pereira. "We're hoping the network will help move the division toward reducing space requirements and more convenient working hours," he said.

A major factor in Fibronics' favor was that "they had been in the market long enough that we considered them stable," he noted.

Pereira supports approximately 300 IBM Personal Computer compatibles, 15 Unix workstations, three Digital Equipment Corp. Microvines, 30 Apple Computer, Inc. Macintoshes, and a Silicon Graphics, Inc. 280 minicomputer, which acts as a network computer server and runs Unix and Transmission Control Protocol/Internet Protocol.

Pereira acknowledged that he is getting into networking a bit later than other companies, but said this has allowed him to learn by others' mistakes.

Pereira acknowledged that he is getting into networking a bit later than other companies, but said this has allowed him to learn by others' mistakes.



Pereira says he has learned by others' mistakes

DARPA

FROM PAGE 1

for Sematech, the consortium of semiconductor manufacturers.

Claude Barfield, director of science and technology policy studies at the American Enterprise Institute, said Fields had become the lightning rod for an agency that had strayed from its proper course. "DARPA's mission is not to make the U.S. competitive, and they're not competent to do it," he said.

Barfield said DARPA should concentrate its efforts on basic research in areas that would yield direct military payoffs instead of trying to bolster struggling industries.

Worth it

But other government watchers disagreed. "DARPA has done a lot of good over 30 years for the U.S. computer industry," said W. Brian Arthur, a professor of economics at Stanford University. "Without DARPA nurturing very advanced projects, it's not clear the U.S. would be in the leading position it is in today."

DARPA has increasingly devoted its budget — now at \$1.1 billion — to applied research and the development of prototypes it hopes will become commercial products that also have military applications. For example, the defense agency funded much of the effort at Thinking Machines Corp. that led to developments

in the field of massively parallel computing.

Fields, 43, has long urged a strong federal role for the fostering of dual-use technologies, those that support both national defense and economic strength. DARPA can take much of the credit for the development of computer time-sharing, computer graphics, packet-switched

communications circuits, have galvanized the forces in favor of hands-off government.

Sources also said Fields' style — a mixture of intelligence and brusqueness — has not meshed well with the Democrat-controlled Congress upset Bush advisers.

War unlikely

But most observers last week said an all-out war on DARPA would be unlikely to succeed. "Congress loves DARPA, and so does the Defense Department," a former DARPA official said.

Those companies that have been blessed with DARPA seed money do too. "No one else in government comes close to matching DARPA in its ability to manage technology in that critical period between the academic good idea and commercial realization," said Justin Rattner, director of technology at Intel Scientific Computers, Inc., a unit of Intel Corp.

Last year, Intel Scientific won \$7.6 million from DARPA to help the company develop a supercomputer based on Intel's i860 superchip.

DARPA nurtures ideas that companies would not fund on their own, and it ensures picking some winners by backing multiple approaches to a problem, Rattner said.

The agency also increasingly flies a void, Rattner said. "Vendors are capitalizing today on running away from the hard technologies," he said.

NO ONE ELSE in government comes close to matching DARPA in its ability to manage technology in that critical period between the academic good idea and commercial realization.

JUSTIN RATTNER
INTEL SCIENTIFIC

communications networks, artificial intelligence, multiprocessing supercomputers and many of the top computers in office automation.

While those technologies have provoked little controversy, DARPA's more recent sponsorship of HDTV and Sematech and its unprecedented investment three weeks ago in General Microcircuits, Inc., a Silicon Valley maker of gallium arsenide

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Long-promised DEC/Apple rose garden to bloom

BY JAMES DALY
CW STAFF

Digital Equipment Corp. and Apple Computer, Inc. are expected tomorrow to deliver on a long-standing pledge to provide cross-platform connectivity products. However, the better-late-than-

never approach may be too little to pry users away from the third-party offerings that have flourished in the 28-month dead zone since the original promise was made.

Instead, users contacted by *Computerworld* are hoping the offerings will take the sting out

of the high cost of Macintosh-to-VAX connectivity by heating up the competition and driving down the price of third-party offerings.

"There is a big price barrier in looking the Macintosh to the VAX," said Mike Bailey, a systems integrator at Lockheed

Missile and Space Co. in Sunnyvale, Calif. Bailey added that providing Apple-to-DEC connectivity in a Vaxcluster can run as high as \$30,000.

Analysis said that the absence of an Apple/DEC offering has helped to keep prices for alternatives high.

DEC promised more than two years ago to pave the way to Mac-to-VAX and Mac-to-DECnet connectivity with Network Application Support (NAS), a set of tools and communications protocols such as X.400 and Open Systems Interconnect that were designed to allow a variety of client systems to access VAX services such as electronic data interchange and electronic mail. But since that time, the companies have released only assorted specifications and some developer's tools.

Tomorrow's announcement is expected to fulfill that promise, along with a more specific DEC commitment made last fall to make the Mac part of its NAS-based All-in-1 Phase II within 12 months.

Roll out the barrel

The rollout is expected to yield products that address Mac-to-VAX mail, Appletalk for VMS 3.0 and Appletalk-to-DECnet gateways. The products should enable Apple users to talk with DEC systems on a process-to-process basis and enable VAX applications to make full use of the Macintosh's user interface, windowing and graphics.

Analysts said they expect the firms to also offer applications that would allow Macintosh computers to access and add to files stored on the VAX systems using the Appletalk Filing Protocol.

Bill McCloud, document publications systems manager at the Jet Propulsion Laboratory in Pasadena, Calif., said he is looking forward to the announcement. However, he said, "to be honest, I expected something a lot sooner. The alternatives have sometimes been a bit expensive."

In the interval, most users have relied on a mix of public domain software, Apple's Macterminal terminal emulation package and third-party offerings from such vendors as White Pine Software, Alisa Systems, Inc., Pacer Software, Inc. and Digital Communications Associates, Inc. to fill the Mac-to-VAX connectivity gap.

Some analysts said that the interim solutions have been so reliable, some users may be loathe to give them up unless Apple and DEC come up with something spectacular.

"It's almost to the point of, who really cares?" said John Dunkel, a vice-president at Workgroup Computing, a market research firm. "User needs couldn't be put on hold while DEC and Apple hammer out their technology."

Instead, some industry experts said that the companies will need to produce products that not only connect the two architectures but unify and integrate their services.

Senior Editor Elisabeth Horvitt contributed to this report.

CICS Liberator.

Berlin Wall Crumbles

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Matrixx signs up with Sprint

Telemarketing firm first to use multiple ISDN services

BY ELISABETH HORWITT
CW STAFF

CINCINNATI — Telemarketing service company Matrixx Marketing, Inc. last week became both the first business customer of U.S. Sprint Communications Co.'s Integrated Services Digital Network (ISDN) service and the first company to use two long-distance carriers' ISDN services.

Matrixx's move portends a user trend toward using multiple ISDN carriers, particularly among "the big financial and cus-

tomers-service firms that have multiple carriers today and who not only want geographic coverage but full exposure to all the features that each carrier offers," said Thomas Nolle, president of Voorhees, N.J.-based consulting company CIMI Corp.

Matrixx set up a private ISDN network of Northern Telecom, Inc. SL-1 switches two years ago and more recently began using AT&T's ISDN Primary Rate Interface (PRI) service as a way to economize on the bandwidth it needs to support its customers' inbound and outbound tele-

marketing needs, said Curtis Peterson, vice-president of information systems for Matrixx's Consumer Division.

Matrixx signed a three-year contract valued by Sprint at \$18 million, primarily because many of its customers use the carrier, Peterson said. Matrixx's ISDN contract with AT&T is valued at about the same amount, and the telemarketing firm plans to start using MCI Communication Corp.'s ISDN service as soon as the carrier makes it available, he added.

Matrixx, whose agents handle inbound and outbound marketing, customer service and complaint calls for its clients, currently has more than one thousand 800 numbers routed to its service centers by all three carriers, Peterson said.

The major benefit that Matrixx hopes

to realize from its PRI ISDN lines is that of bandwidth economies, which will come primarily from the dynamic-allocation T1 bandwidth for inbound or outbound calls on the basis of traffic needs, Peterson said. However, while both AT&T and Sprint have indicated that they will provide this feature, neither carrier has delivered it to date, he added. Matrixx is also using ISDN's 1.5M bit/sec. PRI pipelines to carry voice and data traffic between various sites and two data centers.

Another future ISDN benefit that Matrixx is waiting for is consolidation of various inbound and outbound services over one or two local ISDN pipelines, Peterson said. The telemarketing firm is currently talking with US West about providing ISDN on the local loop.



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Sun adds booster to Sparcstation

BY JAMES DALY
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. boosted the performance and graphics capabilities of its flagship Sparcstation 1 workstation last week, setting the stage for a major new workstation introduction the company is expected to make by late spring.

The rollout of the Sparcstation 1+ also represents Sun's first return volley to recent workstation announcements from IBM and Digital Equipment Corp., both of which were aimed at chiseling away Sun's leading position in the incendiary workstation market.

In addition, Sun officials said they have reduced the price of add-on memory and storage devices by as much as 50%.

The Sparcstation 1+ now replaces the earlier model and will sell for the same price of \$8,995.

Sun spokesman John Loiacono said users of the older Sparcstation will be able to upgrade their machines to the new model, but the upgrade path has not yet been worked out.

The new model delivers 20% more processing power than the earlier version because of Sun's switch from a 20-MHz to a 25-MHz microprocessor, Loiacono said. The Sparcstation 1+ also delivers a 25% graphics boost over the performance of the Sparcstation 1GX, he added.

Sun has shipped more than 50,000 Sparcstation 1 computers since the product's introduction last April, making it the fastest-selling workstation based on the reduced instruction set computing architecture.

However, industry analysts said that Sun's continued dominance in the workstation market is far from a sure thing. IBM, which renewed its push into the market in February, is expected to have a major impact, while such leading vendors as Hewlett-Packard Co. and DEC are also expected to keep up the pressure through a continuing series of price/performance enhancements.

Sun President Scott McNealy has indicated that the firm is considering broadening its distribution strategy through retail outlets. So far, Sun has balked at making the move, although vendors such as Apple Computer, Inc. that sell workstation-like machines have had great success in that area.

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Cisco Systems to support frame relay interface

BY ELISABETH HORWITT
CW STAFF

Last week, Cisco Systems, Inc. became the third interconnectivity vendor to announce plans to incorporate Stratacom, Inc.'s frame relay interface into its products — a trend in the bridge-and-router industry that has sparked interest among network managers who are looking for more cost-efficient ways to interconnect remote local-area network sites.

Both Digital Equipment Corp. and Vitalink Communications Corp. announced similar agreements with Stratacom during the past few months. The re-

sulting interfaces would allow the companies' routers or bridges to pass on LAN transmissions to a Stratacom IFX and eventually to other multiplexers or services that support the CCITT Frame Relay standard, according to Stratacom product line manager Brian Button.

Frame relay is being evaluated by technical managers at Hughes Aircraft Co., which currently uses routers from Cisco, Vitalink and DEC, said Tom Nakamura, a product manager of engineering design networks at Hughes. "We have a very, very large Ethernet-based high-speed network, so we are always looking for technology" that will speed up inter-

connections and lower costs, he said.

The CCITT Frame Relay standard is said to allow a multiplexer to allocate wide-area network bandwidth to voice, data or video communications on an as-needed basis. Stratacom estimated that this provides bandwidth economies in the neighborhood of five to one, Button said.

"If frame relay routers work the way vendors claim, it will save us bandwidth and hardware," said David Pearson, data operations manager at *The Boston Globe*. The *Globe* recently signed a contract with Stratacom and DEC under which Stratacom's frame relay T1 multiplexers will handle voice and data communications

among three *Globe* sites.

One major potential advantage of frame relay is an addressing scheme that allows a single bridge and T1 multiplexer to handle communications between the local LAN and multiple remote LANs, Pearson said.

Cisco plans to offer frame relay support as a software upgrade for its routers, "which will come out with our subsequent software releases for a nominal cost" by the end of third quarter, said business development manager Edward Kneel.

Stratacom rival Network Equipment Technologies, Inc. (NET) said it will resell Cisco's frame relay option as part of its reseller agreement with Cisco. But NET has yet to commit to a frame relay plan for its own T1 switches.

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Marshall Field faces IS cuts after aquisition

BY ELLIS BOOKER
CW STAFF

CHICAGO — The famous clock on the facade of Marshall Field & Co.'s State Street store may strike midnight for its information staff following its purchase by Dayton Hudson Corp. in Minneapolis.

Last week, Dayton Hudson, which paid \$1.04 billion for Marshall Field earlier this month, said in a letter to Marshall Field's corporate stockholders that it planned to eliminate 1,700 non-department store jobs in Chicago, centralizing these functions in its Minneapolis headquarters.

Between 1,300 and 1,350 of the cuts will come in the administrative and operational areas, which include the information systems department. The terminations are expected to take place June 1, when the takeover of the 15,000-employee Marshall Field chain becomes official.

How Marshall Field's IS operation, which employs between 300 and 400 people, will be cut down could not be learned from either Dayton Hudson or Marshall Field's IS executives, who held closed-door meetings in Chicago late last week.

Another question is what Dayton Hudson will do with Marshall Field's major systems projects. The largest of these is Marshall Field's movement from its Unisys Corp. mainframe to an IBM 3090 Model 400 platform, a project that was to be completed in a year and a half. Marshall Field is also replacing its NCR Corp. point-of-sale registers with intelligent systems from Nixdorf Computer Corp., which are not compatible with Dayton Hudson's systems.

One executive in Marshall Field's IS department, who asked for anonymity, said Dayton Hudson could have trouble centralizing the data processing operation outside of Illinois, where Marshall Field has 17 of its 27 retail stores. He said Marshall Field does 85% of its networking within one local access and transport area with Illinois Bell and added that running the operation from a remote location may be deemed too expensive.

Changes are already afoot. Last week, the formerly independent network and telecommunications departments were placed under the control of Marshall Field's IS unit.

INTRODUCING PC/FOCUS 5.5

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NCR product set could jump start ISDN, OS/2

BY JOANIE M. WEXLER
CW STAFF

DAYTON, Ohio — NCR Corp. announced a workstation product set last week that could play a role in shifting ISDN and OS/2 — two high-promise technologies still revving their engines — into gear.

The company said it will ship an Integrated Services Digital Network (ISDN) workstation in June that includes OS/2 1.1 and runs on Intel Corp.'s 80386SX microprocessor. Also available will be an IBM Personal Computer AT-compatible ISDN adapter and application software

that combines voice-mail functions with simultaneous data transfer.

The products, designed for ISDN Basic Rate Interface, require Microsoft Corp. and IBM's Presentation Manager, OS/2's graphical user interface. They will run in AT-bus environments for desktop-to-desktop communications through an ISDN-capable private branch exchange or an ISDN Centrex switching service that is provided by the local telephone company.

Jeffrey Fritz, a data communications analyst at West Virginia University and a beta-test user of the \$7,795 NCR ISDN Workstation, said, "The products should

heighten user interest in ISDN because they provide an application unique to the technology."

Two years ago, when NCR began developing the products, ISDN was a buzzword that has since eroded into such skeptical definitions as "I still don't know." Like OS/2, which also held more immediate promise two years ago, ISDN has been a technology in search of applications. It has also seen implementation delays because of complexities in updating central office equipment and incomplete standards governing transmission between switches.

Jose Nabichsky, vice-president of sys-

tems architecture at SMS Data Products Group, Inc., is testing the NCR adapter card for a large regional Bell operating company with 150,000 users. He sees a strength in the card's embedded X.25 packet-switching protocol, as he is evaluating the product for use in an X.25 backbone that runs over ISDN channels.

The NCR ISDN Personal Computer Terminal Adapter is included in the workstation set, priced separately for \$1,695. Nabichsky suggested that NCR should offer less-expensive versions of the adapter card with reduced functionality.

There are many other ISDN terminal adapter cards on the market. Telos Communications, Inc., for example, offers a card that includes a voice-processing chip but is not yet compatible with OS/2 machines. International Computers Limited, Inc. (ICL) offers an OS/2-based, AT bus-compatible ISDN workstation and adapter minus the voice-mail application.

ICL said it expects to announce an IBM Micro Channel Architecture (MCA) version of its adapter card this week, and NCR predicted that it would roll out MCA-based versions of its products by year's end.

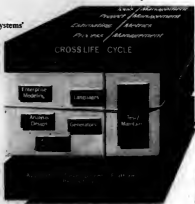
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BY GARY H. ANTHES
CW STAFF

GAO confirms VA systems revamp

WASHINGTON, D.C. — Computer systems at the Veterans Administration, which was elevated to cabinet status last year to better serve 27 million veterans, are not able to give top management the information that it needs to assess the quality of the agency's health care system or the effectiveness of its services.

That is the conclusion of a study by the U.S. General Accounting Office (GAO). The GAO said VA information is scattered across 150 automated systems — some 1960s-vintage batch systems — as well as numerous ad hoc manual systems. Information in these systems is not efficiently collected or easily accessed, and much of it is duplicated, missing, inaccurate or late, congressional auditors said.

As a result, management of VA programs has been hampered, and service to veterans has been delayed, the GAO said.

The VA employs 240,000 people and has a budget of more than \$28 billion. This fiscal year, it plans to spend \$500 million on information resources and is planning information systems modernization programs that will cost more than \$1 billion over five years, the GAO said.

The GAO cited three VA problems:

- Information systems do not readily provide needed data. For example, the GAO said key data from physicians' records is not captured by medical systems, and data is not available for analyzing the cost of treating patients for specific illnesses.
- An agencywide management information system is so antiquated, it takes field personnel six to eight weeks to manually prepare data for management reporting.
- Systems are decentralized, incompatible and labor-intensive. One result is veterans often have to wait two to three months to receive requested benefits.

The GAO said the VA has taken a number of steps to improve its IS.



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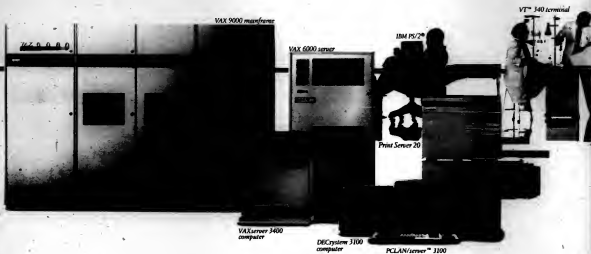
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ADVANCED TECHNOLOGY

TECH TALK

Coordinated efforts

MIT's Sloan School of Management and its Artificial Intelligence Laboratory are co-founders of a new research center dedicated to examining how information technology can help people work together more effectively.

Researchers at the Center for Coordination Science plan to specialize in coordination science, which includes developing computer tools that facilitate work and theories of how coordination occurs among networks and other organizational systems. Researchers will investigate groupware, computer-supported work and collaboration technology.

Making it multimedia

Commodore Business Machines introduced an Amiga personal computer last week that has multimedia and multitasking features aimed at the business, government and higher-education markets. The soul of the new machine, tagged the Amiga 3000, is a Motorola, Inc. 68030 microprocessor, running at either 16 or 25 MHz. The base model comes with 1M byte of random-access memory, a 40M-byte hard drive and a 3½-in. floppy disk drive and costs \$3,299 for the 16-MHz version and \$3,999 for the 25-MHz version. It is also packaged with a new version (2.0) of AmigaDOS and the Workbench graphical user interface.

Cleaning up with robots

The U.S. can substantially reduce the hundreds of billions of dollars needed to clean up chemical and nuclear waste sites by developing robots to perform the job, according to William Whitaker, head of the field robotics center at Carnegie Mellon University. "The necessary technologies have reached the point where we can begin to put together integrated, teleoperated and semiautonomous systems for this purpose," Whitaker said. The cost of a focused effort would be a small fraction of the cost of cleaning up over the next 20 years, he added.

Superconductor firms stay cool

With no room-temperature breakthrough in sight, producers aim to make cold chips viable

BY J. A. SAVAGE
OF STAFF

Superconductors capable of operating at room temperature have been a hot topic for about two years, but progress on developing the materials that could be used in everything from mind-bogglingly fast computers to levitating bullet trains has been nothing short of glacial.

Some scientists said they believe that superconductors could be used in electronic circuitry instead of today's semiconductors. Superconducting chips could be packed densely, shortening the distance that electric impulses must travel and allowing processors to run four to 100 times faster than semiconductor processors.

Circuits made from superconductors would also have a higher signal-to-noise ratio than those made from semiconductors, which would translate into chips that carry cleaner signals with greater precision and efficiency.

The biggest drawback at the moment, however, is that currently known superconducting materials must be refrigerated to temperatures hundreds of degrees Fahrenheit below freezing to lose enough resistance to electricity to make them feasible for use in products such as computers.

Despite the widely reported work on room-temperature superconductors two years ago, the real world of commercial production has centered on making the cold superconductors into products.

"Research is not going toward room temperature," said Ted Van Duser, professor of electrical engineering at the University of California at Berkeley and an adviser to Conduc-

The application of superconducting technology to computers hinges on the ability to fabricate controllable Josephson junctions, devices which are inherently superconducting but are structured like diodes (a device allowing current to flow in only one direction). When thousands of them are strung together they can be made into microprocessors, Smith said. In this case, "controllable" means that thousands of circuits must all have the same characteristics, such as identical limits on electrical current.

"There is no reliable way of making controllable high-temperature [though still refrigerated with liquid nitrogen] Josephson junctions," Van Duser said. So far, Smith added, the quality of high-temperature Josephson junctions is "crappy." The problem could be inherent in the properties of the materials now in experimentation or in fundamental physics, according to Smith.

Conductus officials, as well as academic and big-business researchers, believe that thin-film technology, using layers of yttrium, barium and cop-



Researchers believe that thin-film technology may offer a solution, but they are looking for alternatives as well.

one billion instructions per second. Neither company has detailed how it makes the prototype.

Low-temperature superconducting science has been researched for about 20 years, so many of the bugs have been worked out, Smith said.

No U.S. company has demonstrated a low-temperature superconducting CPU, although Conductus is experimenting with new materials to produce low-temperature superconductors. The company is trying niobium, although the research "is very early on," according to Smith.

Some low-temperature research is going into the use of thallium, but it is both difficult to fabricate and toxic in its basic form (vapor), Van Duser said.

All the commercial computer research is initially going into processor superconductors. Memory chips "will either require a new device or clever circuit design," Superconductors cannot hold a "state" long enough to be used for memory," Smith said. He added that there is no proven superconducting memory design.

The last drawback to use of superconducting devices in computers is that the required supercooling refrigeration systems are often unreliable, Van Duser said. "They have a limited lifetime, some less than one year. They're not like transistors, which go on forever," he said.

Adding refrigeration to a computer system could make for more headaches than any solution systems department would be willing to tolerate. "A systems person has a lot of things to worry about already," Van Duser said.

CONDUCTUS IS ONE of only a handful of U.S. firms working to commercialize superconductors for computers. Some large computer firms, such as IBM and Hewlett-Packard Co., and universities are also working on the problem.

tus, Inc. in Sunnyvale, Calif.

Conductus is one of only a handful of U.S. firms working to commercialize superconductors for computers. Some large computer firms, such as IBM and Hewlett-Packard Co., and universities are also working on the problem.

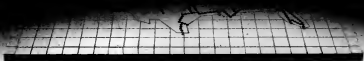
The companies trying to move superconducting devices from drawing board to marketplace face many hurdles, however. For instance, IBM began such a program in 1967 and has been to a product. Like the others, Conductus is in it for the long haul — it has "no products and no timetable for them," said Ora Smith, the firm's chief marketing officer.

per oxide, may offer a solution. When deposited on a substrate, their crystalline structures align, allowing the film to lose all resistance to electricity at 90 degrees Kelvin (163 degrees below zero degrees Celsius). The film deposition has to be smooth — any peaks will short-circuit, Van Duser said. Researchers are also looking for alternatives to thin-film materials, Smith said.

Both Hitachi Ltd. and Fujitsu Ltd. in Japan have announced low-temperature Josephson junctions this year. Low temperature, in this case, is about 4 degrees K (-269 C). While neither company has a commercial product, each claims that its prototype achieves



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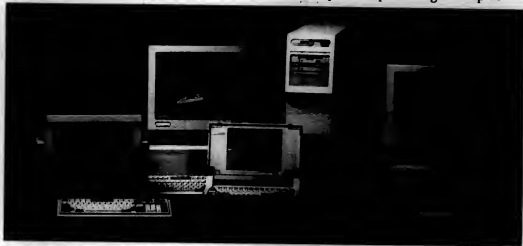
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EDITORIAL

War! (Yawn)

THERE'S A LITTLE joke going around that goes like this: If the Soviet economy went to war with the Japanese military, no one would win.

This image befits the "war" that has been waged for the past 18 months between rival Unix factions — namely, the Unix International advisory group and the Open Software Foundation.

Recently, after several months of trying to wage peace, the combatants declared their differences irreconcilable. So, like the great armies of World War I, both have once again retreated to their trenches, where, smugly squatting, they will occasionally fly raids against one another if for no other reason than to show the world they are still alive.

In case they haven't noticed, the world is rapidly losing interest in this squabble. In a major telephone survey earlier this year, *Computerworld* asked more than 300 senior IS managers to list the technologies of greatest interest to them. Nine (that's right, nine out of more than 300) said Unix, one fewer mention than electronic data interchange.

Could it be that key decision-makers get easily turned off by standards squabbles being waged within the vendor community — which, we might mention, is the wrong place to play out such dramas in the first place? Consider what happened to the personal computer software vendors last year. Internecine vendor brawling over everything from PC operating systems to user interfaces to desktop publishing fonts resulted in plummeting sales as customers sat on the sidelines watching the event.

Surely the Unix stalemate can have the same impact on those many customers seeking the portability and other benefits of the operating system. Is it too wicked a thought to posit that this situation actually *benefits* some of the very combatants in the great Unix struggle? Whadyamean?

If you recall, one of the most remarkable aspects of the creation of the Unix alliances was the composition of the alliances themselves, especially the OSF. The thought of DEC, IBM, Hewlett-Packard and so on — companies that had made their fortunes on proprietary solutions — getting together to work on an operating system standard was certainly entertaining. Even more entertaining was the thought of AT&T, whose stubbornness and arrogance catalyzed the war, actually settling differences with OSF.

So now we have stalemate, confusion and waning interest in the war within the user community, if not waning interest in Unix as a "standard." In the meantime, the individual brigades of the two armies are aggressively pushing what really look and smell like proprietary solutions and package deals (which admittedly include some Unix components).

Like they say, war is heck.



LETTERS TO THE EDITOR

Motif on the move

In Douglas Barney's article "Sun's great challenge" (CW, Feb. 26), references were made to OSF/Motif that did not accurately reflect the facts about this technology. The facts are:

- OSF/Motif has over 500 source licenses worldwide, and approximately 70% are software developers.

- OSF/Motif is the default windowing system for IBM's RISC System/6000.

- OSF/Motif has been selected by Digital Equipment Corp. as the graphical user interface technology for all of its product lines.

- OSF/Motif is Hewlett-Packard Co.'s user interface for its New Wave products.

- OSF/Motif is the user interface component for The Santa Cruz Operation's Xenix operating system in the Open Desktop environment.

In addition to this widespread acceptance of OSF/Motif by some of the world's largest computer vendors, the European Economic Community has endorsed OSF/Motif as its standard graphical user interface.

OSF/Motif is well on its way to becoming the industry's standard interface.

Charles P. Reilly
Vice-President, Operations
Open Software Foundation
Cambridge, Mass.

Why OS/2?

As I understand Bill Gates (CW, Feb. 26), one of the main advantages of OS/2 "is a single binary standard: one instruction set, one operating system."

I must say that I do not understand how running on a "single platform" could possibly be an

advantage and that mutual hardware-software dependence, while self-reinforcing, is a mire that only worsens with time.

But this is not the point, because OS/2 does not run on a single platform, with a single instruction set. It currently supports two instruction sets: the 286 and the 386 with 16-bit addresses.

Perhaps the 286 is a dead issue (unless you own one), so consider only 386 and 486 platforms. If I buy a new 486 machine instead of a workstation, which operating system should I buy for it: Unix System V/386 Release 4.0 or OS/2 2.0? Intel tells me that V/386 has just what Gates says I need: the Intel Unix ABI, a standard for all Intel 386- and 486-based systems. I will be able to buy "shrink-wrap" software for either operating system, so what is the advantage of OS/2 over Unix for my new 486?

James Tyrer
Green Valley, Ariz.

1-2-3-M myth

The wording of your recent 1-2-3-M articles suggests that the features now being offered by Lotus Development Corp. are somehow unique or have not been available until now. This is not the case. Our Electronic Spreadsheet System has been in production since April 1983 and has been fully compatible with Lotus' 1-2-3 for many years. Our spreadsheet offers a slightly different, enhanced, SAA-compatible but fully Lotus-compatible user interface. The Lotus product offers no additional capability or functionality and costs considerably more than our product.

Articles such as these do a disservice to your readers and

small vendors everywhere by neglecting the facts and perpetuating the myth of perceived quality and functionality based on marketing power so prevalent in our industry.

F. Thomas Cox
Vice-President, Marketing
Trax Software, Inc.
Culver City, Calif.

A Clear Mistake

In your article about AFIPS (CW, April 4) you refer to the ACM as the "Association of Computer Manufacturers." The implication is an interesting one, that the college professors and students, both graduate and undergraduate, that I know as members of the ACM are actually building computers on the side. Does this mean that Compaq is really run by a wild-eyed pack of digital delinquents in a basement somewhere? IBM's policies are directed by artificial-intelligence Ph.D.'s? (That would make a lot of sense!)

Seriously, ACM is the "Association for Computing Machinery," an old and venerable collection of data processing persons, both academic and professional. I do not recall the existence of any corporate members, although corporations sometimes co-sponsor special ACM events.

Charles D. Frost
Riverside, Ala.

Computerworld's welcome comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Latta, Editor, Computerworld, P.O. Box 9171, 375 Connecticut Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.

Take responsibility for security

BRYAN KOCHER



The need for the unglamorous work necessary to shore up the security of our electronic networks is getting lost in the hype about hacking and the media circus surrounding the Robert T. Morris case. Responsible computing professionals have a duty to guard the security of all computing resources.

Hacker activities on Internet have focused attention on the vulnerability of many networks to security violations. To date, action on increasing network security has focused mainly on empty rhetoric seeking to scare away hackers. Self-proclaimed spokesmen for the network community have proposed heavy fines and long jail sentences for hackers. None have proposed heavy spending and a strong effort developing secure operating systems and network protocols.

Clifford Stoll spent a year tracking down the German intruder attacking his system and its attached networks. His work makes gripping reading, but the cost to his installation was huge. Stoll was lost to normal duties

for most of that year. Think of all the hacking that could have been prevented by a man-year of security enhancements.

Start off slow

Many basic security improvements are obvious, tedious to implement and loudly opposed by some users. However, small changes, such as removing generic debugging accounts from related systems and removing debugging facilities from released utilities, would go a long way toward improving security.

Investment in developing secure networks and systems needs to be dramatically increased by both private industry and the U.S. government. The U.S. economy is becoming information-based, and safe, reliable and durable data networks are essential for it to flourish.

The automated teller machines on so many street corners are simple evidence of the need for strong network security. People are becoming concerned about the safety of their money tied to computer networks. Wherever there is public concern, there are politicians waiting to capitalize on that concern.

The networked, personal goods we are most vested in are the tools of hacker attacks have not given Congress or the public any res-

on to allay their fears. If computing professionals do not take the lead in this vital concern, Congress will.

A few years ago, the idea of regulating computing profes-



sionals was idle talk. Today, it is congressional staff policy. In September 1989, the Subcommittee on Investigations and Oversight of the House Committee on Science, Space and Technology issued a report called "Bugs in the Program." One finding was that the U.S. government does not get the same value for its money in computing as it does in other engineering services, because of the lack of standards and discipline in the com-

puting profession. After noting that licensed software engineers in the UK are required to "sign off" safety-critical systems, the House issued a clear threat: "It is the right of the government, when contracting for the purchase of software, to include any provision that a prudent customer believes will assure a quality product. If certification or licensing will achieve that goal, then it is in the best interests of

Viewpoint piece noted that a state district attorney suggested an "attest" punishment for Morris — a lifetime prohibition from employment in computing (CW, March 26). Permanent exclusion from computing would not be unusual in any other profession, and it should be in consonance with the congressional recommendation.

All professions that are deemed crucial to the well-being of the populace are licensed and regulated by the government. Lawyers who violate the law can be disbarred. Pharmacists who are caught dispensing drugs without a prescription can lose their licenses. Even plumbers who chronically violate the building code can be suspended.

The federal government is willing to impose regulations on the computing profession if we do not show at least the same professional responsibility as lawyers, pharmacists and plumbers. Practicing professionals should demand responsible action from their peers.

Network managers must increase security so that members of the network can pursue their work free from hacker harassment. The computing community should pressure vendors and the government to vigorously pursue secure networks and systems. We should look to ourselves and our peers to protect computing resources and our profession.

the government to require that contractor personnel have these credentials. This committee believes that a professional community should be permitted to enforce its own standards so long as it demonstrates fair, impartial and expeditious consideration of these questions. *Failure of the software community to accept their responsibility in this way leads to the loss of their proud autonomy.*

A recent *Computerworld*

Kocher is a senior consultant at Consultants for Management Decisions, a Cambridge, Mass., software development and management consulting firm.

Japan Prize bestowed on father of AI, MIT's Minsky

CHARLES LECHT



Americans cannot help but take pride in the Japanese government award given to Professor Marvin Minsky, head of the department of artificial intelligence at the prestigious MIT. After all, Minsky often referred to as the father of AI, is a product of U.S. schools and a prominent member of the U.S. scientific community.

On April 17th, Minsky was awarded the Japan Prize, which, in addition to a medal, Minsky, 50 million yen (about \$350,000).

The Japan Prize is awarded by the Science and Technology Foundation of Japan and is Japan's equivalent of the Nobel Prize for extraordinary work in science. Minsky was honored for his work in a category designated "Integration — Design, Pro-

duction and Control."

Minsky is the father of AI in the eyes of the Japanese scientific community. He founded the AI Laboratory at MIT, and it was in this laboratory that inventions such as LISP (created by John McCarthy) emerged. The AI lab also pioneered the symbolic manipulation of mathematical expressions, representation of sequences in natural language, computer recognition of three-dimensional objects, robotics and scores of other theoretical subjects that have produced practical results in our computer world.

It was also at MIT's AI Laboratory that the problem of processing everyday human conversation with computer systems was attacked and practical results achieved. Minsky proposed a theory of "frames" that became a model for representing and utilizing "knowledge" in computer systems. This became the basis for many kinds of software designs in the field of expert systems.

Minsky says it is his opinion that programming computers to do human tasks is impossible if not approached as a composite of many cooperating systems of theories.

He further offers us the outrageous, if not radical, idea that if computers are to emulate human behavior, they must be imbued with not only intelligence but powers of reasoning, emotions and even a concept of "self."

This led Minsky to write his most recent book, *The Society of the Mind*, in which he analyzes how the human brain works to support his theories. In it, he proposes a computer model of the mind, which consists of sub-agents working together by communicating with one another. As I see it, it is the ultimate neural network.

Minsky's model proceeds from a study of the minds of children rather than adults. He says it is far easier to understand what is in the mind of an adult "expert" than in that of a newly born child. Here we have the kind of simple paradox that

Minsky loves to offer and that challenges our inclination to think otherwise.

As if unimpressed by the complexity of the kinds of skills found in adults, he notes that "expertise" proceeds from formula, which, after all, may be retraced or programmed. However, the processes of thought in a baby



Japan's emperor and prime minister were on hand to honor MIT's Minsky.

have thus far defied programming, so it is from studying babies that the most fruitful work in creating truly humanlike AI must proceed.

It is in recognition of his ideas to attack the AI problem at the very foundation of human intelligence — how babies think — that motivated the Japanese scientific community to award Minsky the coveted prize.

At the award ceremony, I truly understood the importance of the Japan Prize to the Japanese. The scene was the National Theater. The ceremony opened with a procession of at least 100 of Japan's scientific intelligentsia. After this, came Prime Minister Kaifu and those of his ministers involved with scientific administration. Then came the entrance of none other than Emperor Akihito, Empress Michiko and the latter's lady-in-waiting.

Japan's finest were there to honor Marvin Minsky, for his work in AI, and a group of three others, for their work in earthquake prediction.

However, it was Minsky who stole the show. It was he, along with his wife Gloria, who led the procession of laureates into the hall and was awarded the prize first. He warily and eloquently lectured on his science, and it was his hand that the Japanese emperor clasped first as he and his entourage left the stage after the two-hour ceremony.

Three cheers to the Japanese government for its recognition of Minsky. In science, it stands truly wonderful Japanese/U.S. event. And it put money — a lot of it — with its prize. What more could anyone ask?

Lecht is an IDC News Service correspondent based in Tokyo.

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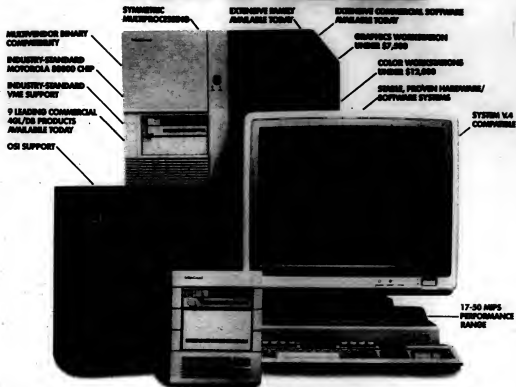
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SYSTEMS & SOFTWARE

HARD TALK

Rosemary Hamilton

More Summit speculation

The latest speculation on Summit, IBM's next-generation mainframe, says that the company will deliver the new system in two phases. The first release, expected later this year, will be primarily new packaging with few real Summit features. The real performance wallop will be delivered in the second phase, scheduled for sometime next year.

A word of caution: The above information may be flat out wrong several months from now.

Then again, it could prove to be quite accurate.

This is not an attempt to play both sides and come out looking like we had the right information. Instead, we are making the point that Summit seems to be a moving target these days. It has moved from being called a 3090 J Prime to a mini-Summit to a two-phase Summit release. The most current information is different than the Summit talk just weeks ago.

That means one of two things: Either the rumor mill has reached that out-of-control state where all sorts of speculation is tossed about, or decisions on exactly how Summit will be rolled out are still being made at IBM.

My guess is there may be a bit of the anything-goes kind of

Continued on page 37

Legent enters end-user realm

BY ROSEMARY HAMILTON
CS STAFF

Beta-test users of Legent Corp.'s Automate/MVS Release 3.0 said the software boosts their management capabilities while bringing them closer to the end-user world by providing support for the IBM SQL standard.

"Version 3 is a tremendous update," said Richard Stevens, an assistant vice-president at United States Trust Co. "Going from [Release] 1 to 2 was a few

new things, but this was a major effort."

With Release 3.0, which began shipping this month, Legent added support for IBM's SQL standard, allowing users to set up and use data in a relational format akin to the IBM relational database management system environment. The new component is called the Relational Data Framework, and it allows users to organize data on both operations and applications in two-dimensional tables. Data is then

accessed via standard SQL calls.

"The SQL standard is very important," said Howard Taylor, an assistant vice-president at the Geoserve Wholesale Computer Services division of Manufacturers Hanover Trust, which tested the Legent software. "That's really part of the whole idea behind [IBM's] Systems Application Architecture — a common access to data, no matter what machine you're on, no matter what environment you're in."

According to Suzanne Nicastro, product manager at Legent, the Relational Data Framework was designed "to be consistent with standards for the IBM repository."

Legent also added a feature called the System State Manager, which handles the task of spotting problems and fixing them. By using data stored in the Relational Data Framework, the System State Manager keeps track of the system's actual status and what it should be. It is intended to flag problems and fix them.

Savvy steel company
LTV Steel Company, Inc. beta-tested Release 3.0 and expects it to bring a more sophisticated level of control to operations, according to Frank Silich, coordinator of computer operations.

"There'll be more control than we have today," Silich said. "With the SQL table, you'll have only one source, and it'll be predefined, and you just do queries to that one table."

Silich said the software will be used to better manage the 35 CICS regions and coordinate the many jobs running in those areas. He also said he expects it to attack the constant flow of messages and reduce the output to only those that are necessary.

"We have a lot of programmers who have messages coming out of their jobs, and now we'll be able to control that," Silich said. "Now we can code by rules to dictate what messages we want."

Stevens said Relational Data Framework is a big step up from the software's previous method of managing data.

"The storage was in the Automate address space," Stevens said. "It was limited and there were only certain things you could store in there. The relational table environment will be as if you have one global view of the world and will keep track of the status of the machines."

FEATURE: MAINFRAME STRATEGIES

Mainframe muscle defined

BY BARBARA FRANCESCT
SPECIAL TO CW

The mainframe is dead; long live the mainframe!

That's hyperbole, but the role of the mainframe is changing dramatically. Yesterday's all-purpose processors are evolving into tomorrow's data repositories, network managers and file servers connected to a host of desktop processors.

The mainframe will be the centerpiece of a decentralized strategy according to IS managers and analysts.

"By the end of next year, we'll start a large-scale migration to distributed processing," says Bill Donsett, manager of worldwide capacity planning at Texas Instruments, Inc. "Once the operating system and interfaces are in place, it will go quickly — all controlled from the mainframe level."

Because personal computers and workstations offer business pluses such as price/performance breaks, increased system availability and local responsiveness, companies are offloading many processing tasks — formerly the domain of the mainframe — to the desktop.

At TI, "the strategic direction is to use de-



John A. Woody

tributed processors — especially Unix processors — at the departmental level," Donsett says. Marketing, manufacturing and inventory will be distributed functions, he adds.

"Corporate-level applications, such as personnel, administrative functions and financial consolidations, will continue to run on the mainframe, which will act as a traffic cop for a worldwide network," he says.

Continued on page 36

Francesct is a free-lance writer based in Bloomfield, N.J.

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Archiving: A valuable asset

ON SITE

BY SALLY CUSACK
CW STAFF

Remember college? Remember the thick, dog-eared book parked permanently on the corner of your desk? Chances are you don't use the dictionary as much anymore, but the editors at Merriam-Webster, Inc. have been working since 1831 to keep it current. Not surprisingly, archived data is their most valuable asset.

The Springfield, Mass.-based company, owned by Encyclopae-

dia Britannica, Inc., is using a Hewlett-Packard Co. HP 3000 Micro GX to run its citation system. Citations are compilations of word meanings and usage — the method by which a word is defined. Text passages are also collected for cross-reference purposes. There are over half a million of these passages stored in machine-readable format, and there are 30 million words archived all together. By the end of this year, the company expects to have the entire corpus of text committed to compact disc-read-only memory (CD-ROM) or another type of media.

"We used to construct citations using photostats and carbon copies, cutting and pasting articles and periodical passages and typing them out on 3- by 5-in. cards — whatever worked best," said John Morse, manager of editorial operations and planning. Editors used whatever was handy and worked, he recalled, adding that data is now keyed into dumb terminals connected to the HP minicomputer.

Six people enter the citations, each averaging about 100

per day for a combined total of more than 12,000 citations per month. The terminal screens, originally developed with HP's V-Plus entry software, have been customized for those entries, which appear on an invert-

ed white-on-black background.

"We found it was easier for terminal operators to see that way," said Thomas Cooper, secretary/treasurer at the firm. As director of information systems, he manages a staff of four and oversees two HP systems, one of which handles the accounting operations while the other runs the citation system. There is one stand-alone personal computer on-site, used primarily for telecon and bulletin-board messages.

Cooper has been with the company since they acquired their first computer — a Univac 9200 — back in 1969.

He ditched cards then, "he recalled, remembering that they used a No. 1001 card controller for payroll, order entry and invoicing. The first disk drive arrived in 1974 as part of the Univac upgrade, and the entire setup was replaced by an HP

minicomputer in 1982. Merriam-Webster upgraded to the present system in 1988.

"When I started back in '69, we had 16 people employed in 6-manual services. The Univac purchase cut five people, and the HP deleted six more. Overall, the staff has been reduced by about 40 over the years due to automation," Cooper said. He is careful to mention that cutbacks are always accomplished either through attrition or retirement, never layoffs.

The impending conversion to CD-ROM will not eliminate any staff members, Morse said. There are 14 million citations on file, some dating back to the turn of the century. The company has collected more than one million of these since the arrival of the Hewlett-Packard system.

"The most important work we do, from an editorial standpoint, is to pick the text for entry," Morse said. "We are here every day, every year, every decade, hammering away at different ways to use the language."

Unique Cray-2 adopted into Livermore family

BY JAMES DALY
CW STAFF

LIVERMORE, CALIF. — A one-of-a-kind Cray-2 supercomputer has been added to the stable of high-performance machines held by the National Energy Research Supercomputer Center (NERSC) at Lawrence Livermore National Laboratory.

The unique \$19 million machine was built with four processors instead of the typical four and may be the only one ever built, according to Dieter Fuss, acting director of the NERSC.

The computer was in development before Cray Research, Inc. split into two companies last May (CW, May 22) and was meant to be a stopgap offering until the Cray-3 computer arrived, Fuss said. "Cray wanted something on the back burner to ease work on the Cray-3 slipped," he said.

When Seymour Cray spun off Cray Computer Corp. last May, Cray Research abandoned work on the Cray-2 and concentrated on its current X-MP and Y-MP lines as well as its next-genera-

tion C-90 series.

Cray Computer finished up the eight-processor Cray-2, but it is continuing to work toward the completion of the Cray-3, which will be based on experimental gallium arsenide chip technology currently being developed at its labs in Colorado Springs.

The eight-processor machine has a theoretical peak speed of four billion floating-point operations per second. Its memory is equal to 64 million words, but that capacity will be doubled to 128 million words within a few months, Fuss said.

No problem

Fuss said there would be no difficulties networking the machine to the two four-processor Cray-2s at the center and that all can run the same software.

Climatologist Jerry Potter said the new Cray will be used for a study on the effects of global warming.

Laboratory scientists plan to use the machine in climate model simulations that will study 100-meters by 100-m sections of the entire earth, Potter added.

SPEC announces first-round winners

BY J. A. SAVAGE
CW STAFF

The top CPU speed for engineering workstations goes to Mips Computer Systems, Inc.'s RCG280 in the first comparative benchmarking results released by the Systems Performance Evaluation Cooperative (SPEC). The top performer in throughput at Silicon Graphics, Inc.'s 4D 3405, with Hewlett-Packard Co.'s Apollo Series 10000 coming in second.

The benchmark suites were run on 10 different technical applications for CPU speed (Specmark) and throughput (Specrtput).

Performance on individual applications varied. Mips' workstation, which is in beta testing, scored 43.7 on the Specmark electrical design automation tool set "expresso." Second place in overall CPU speed, Stardent Computer, Inc.'s 2610 expresso score was 20.3. The IBM RISC

System/6000 Model 540 finished third overall.

A SPEC spokesman said that the cooperative plans to expand its benchmarking suites to test I/O, graphics, configurations of systems and individual workstations. The SPEC cooperative, now composed of 19 firms, was formed in September 1986 by firms with reduced instruction set computing architectures, such as HiP, Apollo, Mips and Sun Microsystems, Inc.

Users can subscribe to SPEC's newsletter, which publishes benchmarking results, to compare aggregate performance or performance on individual applications. Large users can obtain a tape to benchmark internally. SPEC has provided about 150 users with its tape, according to a spokesman.

One such user is Amadiah Corp. in Santa Clara, Calif., which uses the tape to benchmark its Unix mainframes. Frank Smith, manager of one of

the firm's performance analysis groups, said the SPEC benchmark was more realistic than Whetstones and Dhrystones, the suites do not point out the weak spots in memory because with large numbers caching the cache can hold entire small applications.

Smith added that when his group buys its next engineering workstations, the SPEC tape will be a very convenient way to compare vendors' computers.

On smaller computers, Roy Johnson found the Specmark's stress on cache to be useful. Johnson, an applications engineer with Integrated Device Technology, Inc. in Santa Clara, said that SPEC's large programs were realistic, whereas the Dhrystone benchmark can fit entirely in cache, thus not pointing out memory weaknesses. Johnson uses SPEC's tape to measure his firm's own computers — which are based on Mips' architecture — to other computers.

On a steep learning curve with DB2? Or have you resorted to a 3GL to get the functionality required with DB2?

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Small text at bottom left of advertisement.

Mainframes

FROM PAGE 31

The company's PCs and Unix-based processors will function in a client/server relationship, Donetti says. Connections and communications to the mainframe will still be necessary for tasks such as electronic mail and on-line reporting.

The shift in mainframe responsibilities is "happening in a big way here," says Ed Grupp, group vice-president of IS at Ralphs Grocery Co. in Compton, Calif. "Most new processing," he says, "is taking place at our 142 retail units," automating such tasks as time keeping, back door receiving and reordering.

The goal is to turn the data center into a utility, Grupp says. Functions that must remain consistent across the company's stores, such as merchandising and marketing, will remain on the mainframe. "The key is control," Grupp says. "Certain critical parts of our strategy have to be executed the same everywhere."

Mirroring the business

In some companies, the change in the corporate mainframe's identity follows changes in the business itself — after a corporate merger, for instance. Atotech North America, Inc., a chemical manufacturing firm in Philadelphia, is merging three chemical companies — M&T Chemicals, Inc., Penwalt Corp., and Atotech, Inc. — all owned by parent El Aquitaine, Inc.

"As a result, we have a multiplicity of systems," says Robert M. Rubin, vice-president of information services at Atotech. "The most effective way to im-

pify is to reduce the number of systems and simplify their structure, putting data in a repository."

Even with workstations becoming as powerful as the mainframes of a few years ago, "economically, it doesn't make sense to replicate information all over the enterprise," Rubin says. "The concept of distributed data is not as widespread today as it was a few years from now. Today, it's easier to maintain data in one spot than distribute it across networks."

For example, Atotech is moving from many payroll systems to one central system that can be accessed by distributed terminals, Rubin says. "In this way, end users at field locations can get the reports they need and input data," he says.

Some users have been quick to embrace a new role for the mainframe, but others are making only moderate changes in their environment. "Some of our tasks are being distributed, such as data entry," says Bill Young, manager of corporate computer services at GE Corporate Information Technology in Schenectady, N.Y. "But many of our applications are large manufacturing applications. They don't lend themselves to PCs."

However, Young is looking for opportunities to take advantage of the cheaper millions of instructions per second (MIPS) that local processing offers. He is laying the groundwork by distributing financial applications, such as data entry-intensive accounts payable, to the local level. Payroll and general ledger, however, will remain on the mainframe.

At Air Products & Chemicals, Inc. in Allentown, Pa., David J.

Hersh, manager of system development and services, is redeveloping the company's computer systems in favor of a workstation/server architecture, in which the corporate IBM 3090 mainframe will act as data repository — "a large server," he says.

As such, IS and the mainframe will handle "pockets of central functions such as managing the network, capacity planning, setting protocol and gateway standards and backup and recovery," Hersh explains.

The change will be an incremental process, he says: "We'll start the client/server architecture with small work groups of 25 or so end users. Then we'll bridge to the mainframe via a hub-and-spoke architecture. We'll bridge applications early next year. By the end of next year, all employees will have intelligent workstations on their desks."

All these changes mean the mainframe world will expand, not disappear. "Mainframes will be more important but less visible," says Paul Saffo, a research fellow at Institute for the Future in Menlo Park, Calif. "Users will find new tasks for the mainframe," and more data storage tasks from PCs and workstations will go up to the mainframe.

"We expect to have mainframes well into the future," says John Callahan, director of information resources management at Hershey Foods Corp. in Hershey, Pa. "The growing world of PCs and local-area networks is complementary to the mainframe business." Callahan says. As a data repository, his mainframe will deal with such information handling activities as corporate finance, inventory and production planning.

What will it look like?

Consensus among IS managers and consultants is that the mainframe of the future will build on the machines available today. Future systems will increase in capacity but at a slow rate, because as applications are off-loaded to smaller machines within the organization, other applications needing greater bandwidth will replace them.

"New technologies will uplift mainframe demand as users go into production with relational databases, expert systems and image processing within the next two years. These all use lots of MIPS and DASD and will require a technical upgrade," says Jim Cassell, vice-president of the large system service at Gartner Group, Inc., a consulting firm in Stamford, Conn.

For many IS managers, the choices are wide open. "We have to try to get the optimum solution within our financial constraints," says Peter Dengel, assistant vice-president of a large midwestern bank. "That may be PCs, mainframes or a combination — whatever provides the most benefit to the organization."

TDS offers 'cradle to grave' patient system

BY I. A. SAVAGE
OF STAFF

Offering its first new patient care system in 19 years, TDS Healthcare Systems Corp. of Atlanta said its database will now track up to 16 million patients from cradle to grave.

TDS' database and applications system, the TDS 7000 — like its predecessor, the TDS 4000 — runs on IBM 370 mainframe architecture. This is a boon for current users who want to move to the more powerful new system, but it is a big expense to new users because hospitals generally have precious few dollars to spare on the cost of a mainframe-based application and its maintenance, according to health care professionals.

While TDS and other health care vendors have projects to rewrite their software for less expensive new users because hospitals generally have precious few dollars to spare on the cost of a mainframe-based application and its maintenance, according to health care professionals.

The advantage of TDS' new systems, the TDS 7000 Series, is its structured database that allows hospitals to keep a permanent record on a patient, even if several years pass between hospital visits, according to John Whitehead, president of TDS.

The earlier system required users to constantly dump files, according to users.

Since the earlier system was developed before the advent of standards in the computer industry, TDS is looking toward system standardization with the new system. The TDS 7000 follows IBM's Systems Network Architecture (SNA) protocol. It will also be able to integrate off-the-

shelf databases for non-patient care applications such as accounting, the company said.

Patrick Roney, vice-president of medical affairs at Swedish Medical Center in Englewood, Colo., said he was "scooping out" whether his hospital should buy a TDS system — over \$2 million, without hardware — or whether it would be better to build his own system on a Sequent Computer Systems, Inc. parallel CPU platform.

"IBM SNA technology is very expensive," Roney lamented. While voicing concern over exorbitant health care costs, TDS was not explicit in its presentation to health care professionals in Phoenix last month about the financial commitment that hospitals not currently using mainframes for patient care would have to make to TDS architecture — with the expense of hardware and its support.

Lucy Molletan, director of information systems for Princeton Medical Center in New Jersey, said she is looking to replace her 8-year-old system. With a state grant of \$500,000 in hand, "We're in a position to do negotiations with vendors," she said. She has taken time to rewrite the software to allow for modern indexing and addressability. But the 7000 system will be able to manage 20,000 bytes of direct-access storage device memory from an MVS or VSE operating system, said Joseph Schaefer, director of technical sales for TDS. The system does not run under MVS/ESA.

The TDS 7000 will be generally available in late 1991, according to the company.

A has taken time to rewrite the software to allow for modern indexing and addressability. But the 7000 system will be able to manage 20,000 bytes of direct-access storage device memory from an MVS or VSE operating system, said Joseph Schaefer, director of technical sales for TDS. The system does not run under MVS/ESA.

Invaluable IS pros

As the mainframe's role changes, so does that of the information systems manager. That change is "for the better," notes Ed Grupp, group vice-president of IS at Ralphs Grocery Co. in Compton, Calif.

"The IS professional's job will be more important than ever," says Paul Saffo, a research fellow at Institute for the Future in Menlo Park, Calif. "IS managers must make sure the system runs so users can get it."

According to Robert M. Rubin, vice-president of IS at Atotech North America, the IS function will become more of a training function and that of an integrator of systems and activities. "However, [the chief information officer] function," Rubin notes, "will continue to be a role that brings a technical specialty to identify business opportunities and problems."

"This change will require IS to be broader thinkers, to be true systems people — not just developers, or network people or mainframe operating system people," says David Hersh, manager of system development and services at Air Products & Chemicals, Inc. in Allentown, Pa.

"As more distribution takes place, more consolidation of mainframes will take place," says Bill Young, corporate computer services manager at GE Corporate Information Technology. "We will extend our experience with disaster recovery and backup to the user's desktop. We will act as a clearinghouse to distribute applications or as communications hub."

BARBARA FRANCHETTI

SOURCE NOTES

OSF announces new pricing schedule for OSF/1 system

The Open Software Foundation (OSF) unveiled a new pricing schedule for its OSF/1 operating system, based on the Mach kernel developed at Carnegie Mellon University.

A single-CPU source code license with full redistribution rights is priced at \$50,000, with source code for additional CPU licenses priced at \$3,000 each. Source code without redistribution rights costs \$25,000, and a commercial site license, bought in addition to the initial source license, is \$50,000, according to the OSF.

Oracle Complex Systems Corp., a division of Oracle Corp., announced that it will provide direct sales, service and product support for Charles River Data Systems, Inc.'s Relational Accelerator product into the commercial and government markets. The Relational Accelerator is a dedicated database engine designed to enhance the performance of the Oracle relational database management system and applications running in the Digital Equipment Corp. VAX/VMS environment, according to Charles River.

Hamilton

CONTINUED FROM PAGE 31

rumors, but it is more likely that IBM is still in a Summit decision phase.

That means the Summit we will eventually see won't be exactly what we are hearing about now. But it will resemble it.

Where does that leave us? With a very blurry picture of Summit, but a few solid bits of information are better than a detailed picture that could be subject to change.

Basically, we can expect a mainframe announcement from IBM later this year. It will not be a traditional performance kicker. Instead, it will likely consist of a few new features — fiber-optic channel the most widely expected — and some other performance improvements, which some users suggest will be achieved with software tuning.

It also seems likely that some aspect of this announcement will be billed as a Summit announcement. At the very least, there could be a statement of direction from IBM.

More likely, IBM will position this announcement as the initial step to Summit. This could well be more marketing-driven than technology-driven. If it is in the realm of marketing, then it's tough to say just how far IBM will go.

It all hinges on the market climate, and specifically, how much attention Hitachi is getting for its expected high-end mainframe. If IBM sees its top users looking to Hitachi, it could gear this next announcement as the path to Summit.

As such, it could tag some new features as Summit features, even though in reality they could be features that would work with existing 3090s. The idea here would be to give users a sense that they are on their way to Summit. In other words, IBM could take a feature such as fiber-optic channel and call it a Summit feature, when in reality it is a feature that could be made to work with existing 3090s.

If IBM gets really worried about Hitachi, all sorts of features may become Summit features between now and IBM's announcement.

The current Gartner Group Summit scenario goes further than that. According to its research, IBM will introduce a phase-one Summit system that will include all new environmental. It will have the Summit frame, power supplies and cooling system. But inside will be all 3090.

Jim Cassell, an analyst at this Stamford, Conn., research firm calls this "the old wine in a new bottle."

The idea here is to provide users with the Summit foundation, and when the new technology is ready next year, users would be able to pull out their 3090 boards and plug in the new technology.

Just how far IBM goes with the Summit component of this year's announcement is most likely still under consideration at IBM. It is watching the market and determining how much of Summit (or Summit-like features) it must deliver. So users should keep in mind that IBM still has time for fine-tuning, and they shouldn't think that what they're hearing now about Summit is written anywhere in stone.

Hamilton is *Computerworld's* senior editor, systems and software.

DEC takes vertical market tack

BY MAURAJ HARRINGTON
OF ITAP

Digital Equipment Corp. has gone for the vertical market with four sales and marketing system software programs designed to address the needs of less computer-proficient customers.

Three of the packages — the Sales & Marketing Systems for Communications, Proposal Development and Presentations — are commercialized versions of in-house applications used by DEC's own staff for several years, according to Jack Mileski, DEC's sales and distribution systems marketing manager.

Designed to offer a full "plug-and-play" package to its users, the sales and marketing systems are compatible with DEC's Network Application Support (NAS) operating system, Mileski said.

Max for the minimum

While each software program is available separately, the combinations allow users to draw upon the advantages of NAS with a minimum amount of time and effort, Mileski said.

The Sales & Marketing Systems combine AII-In-1 (including electronic mail software and VAX VTX videotex with 35mm Express, a third-party software

program developed by Business and Professional Software, Inc., located in Cambridge, Mass.

DEC has also announced a fourth application, called the Sales & Marketing Worksystem for Pharmaceuticals. This is the company's first in an upcoming series of software packages targeting specific commercial industries, according to a DEC spokesman.

The Sales & Marketing Worksystem for Pharmaceuticals package is also an NAS-based program and includes a Decwindows interface; RDB, a relational database; VIDA; Decdecision; VAX VTX; AII-In-1; and Acumate, a multidimensional decision support product designed by Mount Olive, N.J.-based Effem Services, Inc., Mileski said.

To find out how easy it is to convert DCA's new IRMA from standard to MCA bus, flip the page.



NEW PRODUCTS — SOFTWARE

Development tools

On-Line Software International has announced a DB2 productivity tool that supports DB2 Version 2.2.

Release 5.0 of Proedit enables DB2 programmers to test in distributed data processing environments and offers support of DB2 Alias, which allows DB2 users to access data from other DB2 subsystems, the vendor said. Its embedded SQL testing facility reportedly allows DB2 programmers to check SQL statements while coding.

The product runs on DB2 Version 2.1

or higher in MVS/3A or MVS/ESA environments. It costs \$25,500.

On-Line
Two Executive Drive
Part Lee, N.J. 07024
201-592-0009

Syon, Inc. has announced an add-on product to Syon/2E, an application development environment for the IBM Application System/400.

Syon AD/Cycle Interface Release 1.0 allows users to transfer database specifications from other platforms to the AS/400 and then generate native AS/400 applications from the data model. It runs

on the AS/400 and provides facilities to transfer IBM's External Source Format (ESF) source code from IBM Personal System/2-based design and analysis tools that export ESF.

A license fee for Syon AD/Cycle Interface Release 1.0 costs \$12,000.
Syon
1100 Larkspur Landing Circle
Larkspur, Calif. 94939
415-461-5000

Lawson Associates, Inc. has introduced the Pinpoint Materials Management System for IBM Application System/400 and System/38 computers.

The product was designed to help businesses minimize inventory investment while maximizing inventory turnover. It

includes two application packages — Pinpoint Inventory Control and Purchase Order — and provides features such as analysis, overstock and obsolete inventory evaluation.

Pricing starts at \$20,000 and varies depending on the type of hardware platform used and on the configuration.

Lawson
1300 Godward St.
Minneapolis, Minn. 55413
612-379-0258

NEW PRODUCTS —
HARDWARE

Processors

A memory board that features parity error detection has been announced by Clearpoint Research Corp.

VMERAM-FP1 provides 64M bytes of VME bus-compatible memory on a 6U card that occupies only one slot in a backplane. It features block-mode transfer read access/cycle times of 74/100 nsec and block-mode transfer write access/cycle times of 68/74 nsec, the vendor said.

The price is \$16,200 for the 64M-byte card. Volume discounts are available.

Clearpoint Research
35 Parkwood Drive
Hopkinton, Mass. 01748
508-435-2000



Clearpoint's memory board features parity error detection

Paracom, Inc. has announced a series of parallel processing modules for Sun Microsystems, Inc. workstations.

The modules allow simultaneous access for as many as eight users and feature up to 16 T800 Transputers that provide 200 million instructions per second and 30 million floating-point operations per second.

Single-piece pricing for the MTM-Sun modules begins at \$6,950, while 16-processor systems start at \$23,130. Quantity discounts are available.

Paracom
Suite 400
2300 N. Barrington Road
Hoffman Estates, Ill. 60195
708-293-9500

ICL Business Systems, a division of International Computers Limited, Inc., has announced enhanced versions of its Power-server 386 server.

Features include an increased clock speed from 25 to 33 MHz, expanded disk storage, IBM Systems Network Architecture 3270 emulation and Network File System (NFS) software based on Sun Microsystems, Inc.'s NFS Release 3.2. It is available bundled with a four- or eight-user license for ICL's Officepower Unix office automation package. Prices range from \$23,900 to \$34,000, depending on hard-disk capacity and user license.

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Now T Client/Se A Little

The Sybase View

Client/server architecture is an approach for managing database applications with efficiency, flexibility and control. Specifically, client/server software divides monolithic applications into discrete, reusable and sharable components.

Clients and servers are independent of each other and yet are fully interoperable. The client component handles the user interface and local data manipulation, while the server component provides data management services for multiple clients. The client and server components can run on the same computer or on different computers that communicate transparently over a network.

When client/server architecture is fully implemented, it allows companies to save money and gain a competitive edge in several ways.

- It streamlines and speeds application development.
- It provides a control mechanism for managing data.
- It supports third party applications and tools.
- It integrates external sources of data.
- It improves disaster recovery of business data.

It's important to note that only a full implementation of client/server can deliver all these benefits. While other database products may operate over a network, only SYBASE fully supports client/server with the following capabilities:

PROGRAMMABLE AUTONOMY. Other database products require each client application to correctly implement an organization's approved business transactions and enforce its business rules. With SYBASE, these functions can be programmed centrally—in the server—and shared by all client applications. This approach eliminates redundant coding, facilitates maintenance, and provides a central point of control to protect corporate data.

CONCURRENT ACCESS. By supporting distributed or peer-to-peer communication, SYBASE systems can work in concert without the intermediation of a client application. For example, one server can ask another server to check a potential customer's credit rating before accepting an order. This capability allows organizations to effectively manage data consistency among systems without having to police all application programs, as other database systems require.

OPEN SERVICES. The SYBASE OPEN Server allows both clients and servers to communicate with other relational DBMSs, non-relational DBMSs, file systems, existing application programs, and time data feeds, and other application services. Because SYBASE provides an open interface, companies can implement the exact functionality and/or performance they require. This SYBASE approach contrasts with other proprietary and inflexible "one size fits all" connectivity strategies.

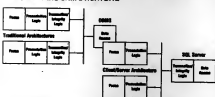
Client/server is far more than a fad—it is an architecture. And only a complete implementation of that architecture can deliver the productivity, control, integration, and cost savings that today's on-line business environment demands.

SYBASE is the only database system to offer such a complete implementation of client/server architecture—with all its attendant benefits—today. That's why SYBASE is the undisputed leader in client/server database management for on-line applications.

The programmable server is the heart of the SYBASE RDBMS.

Designed to protect the integrity and security of your data, the SYBASE Client/Server Architecture also reduces application development and maintenance costs by letting you write organization-wide rules once, directly into the server, and share them among all client applications. Once written in, sophisticated stored procedures and triggers enforce data integrity, security and business rules.

Other RDBMSs force you to spend huge amounts of time writing rules into each application on your network. The danger is that if you miss just one application, you can corrupt an entire database and possibly crash the server and the entire network.



Unlike traditional architecture, a true client/server architecture lets you program transaction/integrity logic once in the server and share it among client applications.

The key to data integrity in a true distributed environment is the SYBASE two-phase commit protocol and remote procedure calls.

While distributed retrievals pose little threat to the consistency of the database, distributed updates require a system that guarantees consistency of data across two or more servers. Only two-phase commit guarantees that consistency.

With SYBASE, information can not only be retrieved, but safely updated across servers. In a recent product comparison, InfoWorld warned: "Currently, you cannot update information across two servers running Oracle. (Microsoft/SYBASE) SQL Server allows such updates, and still maintains data integrity across networks using a method called 'two-phase commit.'" InfoWorld, March 5, 1990, "Dueling Servers."

INER world

"SQL Server is a very different animal... It's fast, does a good job of protecting data integrity. Most important, it implements the kind of leading technology that allows it to adapt to varying requirements without draining financial and human resources in the process."

This view of Client/Server Architecture first appeared in the SYBASE Forum (Computerworld, February 10, 1990).

SYBASE SQL Server's documented and published application programming interface lets developers build transparent front-end or server applications that communicate with relational and non-relational DBMSs (including IBM IMS and DB2 and DEC RMS environments), file systems, existing application programs, real-time data feeds, and application services such as stock quotes and electronic data interchange.

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MICRO
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Charles von Simson

Hang it up, gentlemen

Like every treaty that has kept the peace for a while only to crumble away into conflict, the IBM/

Microsoft agreement for joint development of OS/2 has become obsolete. The problem is simply that it has failed to keep pace with the changes in the world around it.

While IBM and Microsoft both deny any plan to fundamentally alter the secret recipe by which OS/2 responsibilities are divided, neither argues that such a change might not be a good idea.

OS/2 is a complex operating system and would present a challenging task under optimum conditions. Having the job divided between two companies and four development facilities is far from optimum. Officials at both companies concede that some consolidation of resources is necessary. IBM has already begun the process by turning the Boca Raton, Fla., development facility away from OS/2 toward multimedia and Personal System/2-specific work.

While Bill Gates grins uneasily from any podium he shares with IBM's Entry Systems

Continued on page 51

Where should those 286s go?

ANALYSIS

BY PATRICIA KEEFE

OF STAFF

The shift toward an Intel Corp. 80386-based hardware standard raises the question of what to do with all those 80286-based boxes littering Fortune 1,000 desktops.

The 286 holds an estimated 41.3% of the personal computer market, which translates to an installed base of more than four million, according to Mark Levitt, an analyst at International Data Corp. The Framingham, Mass.-based market research firm has found that 33.2% of Fortune 1,000 companies are planning 286 purchases this year, which Levitt expects will push the 286 installed base to 42.6% by year's end.

It is not yet economically feasible to abandon 286 technology — as was the case with its older siblings, the 8088 and the 8086.

"We don't look at it like we do the [IBM Personal Computer] XT, which we view as history," said Andy Gilbert, a consultant in the fibers department at Du Pont Co. According to Levitt, most PCs have a seven-year life cycle; he noted that the 286 was first introduced in 1984.

Most users are taking the slow boat to 386 migration. Although further purchases of 286-based computers are forbidden at many firms, 386 purchases tend to come in dribs and drabs — as new users come in, old computers break down or key power users are upgraded.

As a result, based on sheer numerical superiority, the 286 remains the desktop standard, and it is not going to disappear anytime soon. "DOS is still very important," noted Frank Diaper, vice-president of technology services at Fidelity Investments in Boston. His 4,000-plus PCs represent a lot of applications and man-hours invested in DOS.

Faced with this mountainous platform, users are taking two approaches: They are either retrofitting their 286s to run more sophisticated software — for example, Microsoft Corp.'s Windows — or they are "downstreaming" these PCs to less computing-intensive departmental users.

Both IBM and Wordperfect Corp. claim that their users are looking at the 286 platform for Windows.

Andre Petersen, vice-president of OS/2 marketing at Wordperfect, attributes a recent interest in Windows among his installed base to a dilemma over what to do with all these 286s.

A hot debate is currently raging over whether this makes sense. A Microsoft spokeswoman noted that the company has a design goal of 1M byte of memory for Windows.

Yet a number of analysts and users all agreed that to really take advantage of Windows, it is necessary to equip a 286 with 2M bytes to 4M bytes of memory.

"There are some people running Windows on a 286, but they are probably using only one to two packages," Diaper said. "It's the minimum configuration," Gilbert agreed.

Wordperfect Corp. Lotus
Continued on page 51

Wordperfect sets date for its graphics-based version

BY PATRICIA KEEFE

OF STAFF

BOSTON — Wordperfect Corp.'s Wordperfect for OS/2's Presentation Manager will probably not ship until November, according to company officials. It will be followed by a version supporting Microsoft Corp.'s Windows in the first half of next year.

Andre Petersen, the firm's vice-president of marketing for OS/2, talked about Wordperfect's Presentation Manager and

Windows support plans at an OS/2 customer event two weeks ago. "Presentation Manager is where we feel you have the most future," he said.

Petersen also hinted that users should expect an OS/2 version of Wordperfect Office 3.0 but did not supply any dates.

Wordperfect shipped its first OS/2 application, Wordperfect 5.0, in February 1989. That version is a text-based program.

The code for the graphical Presentation Manager version,

which will be called Wordperfect for PM, is expected to be stabilized by June 15, Petersen said. He then outlined a three-month alpha-testing period and two-month beta-testing period for the product.

The Presentation Manager version of Wordperfect will include support for more than 1,000 printers, he added. Petersen has been critical of OS/2 1.2's limited printer drivers.

As for Windows, Petersen said his company would write to it, "even though we feel it is not necessarily your next migration step forward."

He was more enthusiastic about Officevision, or at least Wordperfect's answer to IBM's

offering. "When IBM announced Officevision, 85% of their installed base standardized on it before they had even seen it," Petersen marveled.

Noting that Officevision has undergone several revisions since then, the latest of which is late, he said that Wordperfect Office offers similar tools, including wide-area network support and desktop publishing.

"We haven't announced an OS/2 version, but if you look at our strategy of putting Office on multiple platforms, you can probably draw your own conclusions," Petersen hinted. It already runs on Data General Corp. and Digital Equipment Corp. platforms.

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“So, Horvath,
what you’re saying
is graphical word
processing is
imperative to the
future of this
corporation. Well?”

HORVATH: Well, Mr. Parnell... I think now's the time to make the change...

PITZER: Sure, that's what Cundy said about our database program two years ago. And we *all* know what happened to...

PARNELL: Pitzer, let Horvath finish.

HORVATH: Based on my comprehensive evaluation, I'm convinced that Word for Windows is the answer.

PARNELL: Word for *who*?

HORVATH: Windows, from Microsoft.

HAMILTON: Frankly, Ivan, I don't see why we have to change at all.

HORVATH: You're missing the point. Graphical computing will soon be the standard. If we adopt the Windows platform now, all of our users benefit. Heavy users would spend hours on projects instead of days. And light users, minutes instead of hours.

The way it stands, we're throwing away a whole lot of money. Not to mention productivity. HAMILTON: But what about that OS/2 business everyone's been talking about?

HORVATH: What about it?... The interface will be virtually the same on Windows and Presentation Manager.

FIDLER: C'mon Horvath... that's a little hard to believe.

HORVATH: Not really... you see, Word for Windows is based on IBM's Common User Access. Once our users learn it, they'll be well on their way to understanding other applications that support CUA.

FIDLER: That's all *very* nice, Ivan, but let's go beyond long-term benefits...

HORVATH: Okay, Fidler. Consider how long it takes to develop a standard contract...

FIDLER: Yeah, what about it?

HORVATH: Using Word for Windows would eliminate the problem. Its Document Template feature can prompt users to input necessary data... So even our paralegals could write contracts.

DELMAN: Just a minute, Mr. Parnell, who's

gonna provide the training?... It may be my job, but I haven't got time for it!

HORVATH: Relax, Delman... Word for Windows has computer-based training and context-sensitive, on-line help. So it's virtually foolproof... users can train themselves. Which means our training and support costs would be reduced and the corporation saves money.

COHEN: But what about the equity we have in our current system? Are you suggesting we trash it?

HORVATH: Not at all...

Word for Windows has complete file conversion facilities...

COHEN: Complete?... *How* complete?

HORVATH: It'll read *and* write to virtually every word processing program.

PARNELL: So let me get this straight, Ivan...

you're saying that Word for Windows is easier to

use and allows people to do more things?

HORVATH: Precisely.

PARNELL: Which could only improve our productivity...

HORVATH: I rest my case, Mr. Parnell.

PARNELL: Most impressive, Ivan. But before I make my decision, I'd like to hear what Cameron thinks. Cameron?... *Cameron?*

LUCERO: Psssst...

Hey, Cameron, wake up!

The preceding scenario has been a dramatization. The benefits of Word for Windows, however, are a reality. For further proof of its capabilities, simply call us for a free brochure. Or order our fully-functional Working Model for just \$9.95. The number is (800)541-1261, ask for the folks in Dept. K56.

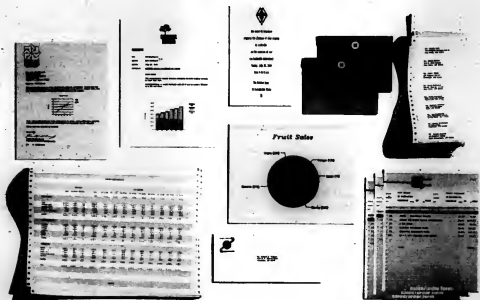


Word for Windows' graphical user interface benefits people who've never even seen a boardroom. As well as those who frequent it.



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SAI driving toward cleaner air

ON SITE

BY JAMES DALY
CW STAFF

Cruise through the smoggy suburbs of Los Angeles on a windless afternoon and the amber haze staining the skies leads a sooty double entendre to the region's once-pride designation as Orange County.

The causes of some of that pollution, however, could soon be on the wane, thanks to the recent introduction of cleaner-burning automobile fuels in heavily polluted areas such as Southern California and the Northeast. The development of some of these gasoline represents a victory for Systems Applications, Inc. (SAI), a small

consulting firm in the foothills of San Rafael, Calif.

Both Shell Oil Co. and Atlantic Richfield Co. (Arco) turned to SAI for computer-modeling studies to measure the emission changes resulting from their new rebled fuels. Using an elaborate battery of nearly 100 personal computers and workstations, SAI can also determine how those gases will then assimilate into the atmosphere once they leave the tailpipe.

SAI used a series of customized software programs to estimate the emission changes expected from using Shell's SU 2000E gasoline in the 10 cities in which it was introduced, according to emission modeling group manager Lyle Chinkin.

The SAI research determined

that a typical automobile burning the SU 2000E fuel emitted about 10% less air pollution than one running on Shell's current premium gasoline, Chinkin said.

Similar tests were done in connection with the introduction of Arco's rebled EC-1 gasoline, and SAI is now working with Arco on a plan to introduce a follow-on product that could be used in all car models.

Using another homegrown application, SAI can factor in environmental factors such as wind flow, cloud cover and temperature to gauge the effect the gases will have on the atmosphere.

Emission information is gathered on a series of IBM Personal Computer clones, Apple Computer, Inc. Macintosh SE models and Sun Microsystems,

Inc. workstations and processed on a Prime Computer, Inc. 750 and a Multiflow Computer, Inc. 7/300 mainframe.

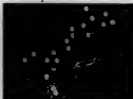
The result is essentially a topographic map of the region's air pollution situation, with mountain

tor air pollution levels and determine ways to reduce them.

Both the Shell and Arco gasoline are actually way stations on the road to the widespread availability of a cleaner suite of automobile fuels, according to SAI Vice-President David Souten.

Central to that goal is the Auto/Oil Air Quality Improvement Research Program, a study financed by the Big Three auto makers and 14 oil companies that is testing 16 fuel and gasoline blends in an effort to create cleaner-burning fuels.

"The concept of alternative fuels is to take the available fuels and reblend them into something that is more environmentally sound," Souten said. "But in the short term, we've got to do what we can."



SAI's emissions maps monitor air.

LTE's success and backlog pushes proliferation

BY RICHARD PASTORE
CW STAFF

Users can expect a lot more notebooks to choose from — and we are not talking loose-leaf vs. spiral. Full-function, notebook-size portable computers are proliferating, driven by the popularity of Compaq Computer Corp.'s LTE/286 and, ironically, that firm's inability to meet demand.

"The LTE is certainly the machine that sets the pace," said Peter O'Connor, a portable computer expert and president of Laptop Expositions in New York.

The LTE's popularity stems from the fact that "it is the first machine to really bring desktop performance to the notebook form factor," said Richard Shaffer, editor of "Technological Computer Letter."

"It definitely sets the pace for the competition," he added.

LTE users call its size "perfect" and tell tales of dropping it from waist-high altitudes with no ill effects. "The LTE is just one super machine," summed up Bob Arakelian, MIS director at God-

va Chocolatier, Inc. in Reading, Pa. "Just the size of it is unbelievable."

Some users are even adopting the LTE/286 as their primary desktop PC. "We're using an LTE in our human resources department as a main computer," said Ken Dick, MIS director at American Express Information Services Co. in Omaha. "They plug it into a monitor for a little bit better resolution."

Taking advantage of Compaq's inability to meet demand, "there are eight to 10 Far East companies that are making what might be called LTE clones," O'Connor said. A 7½-pound model that features an Intel Corp. 80286 microprocessor and IBM Video Graphics Array (VGA) graphics will be available in quantity next month from distributor Personal Computer Associates, Inc. in Ajax, Ont. It will underprice the LTE/286 by more than \$1,000.

"It doesn't surprise me," a Compaq spokesman said of the clone competition. He said that the LTE pipeline is catching up to demand this quarter as origi-

nally anticipated.

However, Compaq faces intensifying competition from big U.S. players as well. Last month, Sharp Electronics Corp. joined the notebook fray, one-upping

entries [CW, Feb. 19].

Other companies are reportedly working on modifications to their notebook PCs to emulate the LTE, observers said. NEC Technologies, Inc. plans a summer follow-on to its Ultralite that sources said would add a hard disk drive.

Zenith Electronics Corp. is also adding a 20M-byte internal hard disk drive to its Minisport, observers said.

Such a change would be appreciated at American Express, which uses Zenith laptops as well as LTEs. "I don't like not being able to carry all my software on a hard drive," Dick said.

NEC and Zenith may be reacting to the writing on the wall. Monthly unit sales of the LTE/286 have climbed from 404 last October to 6,113 in February.

During the same period, Minisport and Ultralite unit sales have dropped 78% and 47%, respectively, according to Storeboard, Inc. in Dallas, which tracks sales through U.S. computer stores.

Other vendors are working feverishly to get a notebook

model out of the lab and onto the shelves. "Compaq is getting a long hard look [by users], and that's kind of discouraging for us," said Tom Humphreys, director of marketing at Grid Systems Corp. "We have to have something to go head-to-head with the LTE."

From TVs to laptops

In the mean time, the notebook and laptop PC market will continue to blossom.

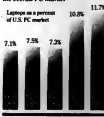
"I think we'll see notebook computers become as popular for the relative market as portable televisions did," Shaffer predicted. "The growth will continue for a long time."

One area of strong growth, according to recent research, is Japan. Japan's notebook-size computer market will maintain an annual growth of 50% for the next several years, according to a report released by Tokyo-based market research firm Aquarius Co.

The report predicted that domestic shipments of notebook PCs will reach 195,000 units in fiscal year 1989 (April 1989 - March 1990) and 450,000 units in fiscal 1990 (April 1990 - March 1991).

On the go

Laptop sales are carrying off a substantial and growing share of the overall PC market



Source: Storeboard CW Chart: Darren Doherty

Compaq by adding VGA graphics to its four-pound 286-based notebook.

A month earlier, Toshiba America Information Systems, Inc. and Texas Instruments, Inc. both claimed in with LTE-style

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Microsoft C system copes with complexity

BY CHARLES VON SIMSON
CW STAFF

REDMOND, Wash. — Microsoft Corp. recently released a new version of its C development system aimed at supporting the growing complexity of sophisticated applications development.

Microsoft C Professional Software Development System Version 6.0 has gained solid initial acceptance from corporate developers for implementing a number of design tools under one interface.

"The key to the system is integration," said Louis Linder, applications project manager at New York Life Insurance

Co. "While it offers some performance improvement, it brings the technology a lot closer to the way we actually manage a project."

With the enhanced version, compiled programs are reportedly about 10% smaller and 10% faster on average than those compiled with C Version 4.1.

The newest version of the development system integrates the editor, a project database, build and add-on tools and a debugger. The environment, which is the same under DOS and OS/2, incorporates an identical user interface for all functions, as well as the capability to maintain settings between sessions.

With the introduction, Microsoft unveiled a tool that will allow access to a project-tracking database created by the compiler. During the compilation pro-

THE ENVIRONMENT incorporates an identical user interface for all functions.

cess, compilers create an enormous amount of information about the code that is generated. The tool, known as the

source browser, will allow access to that information.

Microsoft has also released an optimizing compiler and enhanced debugger as part of the new development system. The new compiler allows users to turn optimizations on and off at different points in a single program, allowing for more flexible testing of optimized code. The improved debugger uses less memory than earlier systems and automatically saves settings such as breakpoints and watch windows between sessions.

Microsoft is also publishing application programming interfaces that will allow other vendors to offer tools that can run under its Programmer's Workbench interface. Twelve vendors have announced products supporting the platform.

MICROBITS

Borland ships Paradox Engine to developers

Borland International is now shipping its Paradox Engine, a C language library that opens the Paradox architecture to enable developers to create, access and manage data.

Samsa Corp.'s graphical word processor, Ami Professional, has been awarded the highest "Overall Evaluation Rating" among advanced word processing programs reviewed recently in *Software Design's* April 1990 Ratings Report. Ami Professional was rated No. 1 in the evaluation, followed by Microsoft Corp.'s Word, Wordperfect Corp.'s Wordperfect and Microsoft Word for Windows.

Sun Microsystems, Inc. recently announced plans to make its line of Scalable Processor Architecture/Unix workstations and servers available to value-added resellers selling Pick Systems-based packages. Sun said it sees great potential in the Pick market, adding that these resellers have expressed interest in Unix as a host environment for Pick applications.

Price Waterhouse and IMRS, a Stamford, Conn.-based company offering financial information services, have agreed to jointly provide implementation services to their respective clients. Price Waterhouse plans to introduce IMRS to clients seeking a microcomputer, local-area network-based approach to financial reporting. IMRS' Micro Control package is used internally at Price Waterhouse and has a customer base of 70 sites.

Digital Equipment Corp. has selected Santa Cruz Operation's SCO Unix System V/386 Release 3.2 as the standard operating system for its new line of Intel Corp. 80386-based systems. DEC has also agreed to distribute a number of SCO's applications and communications software.

Hewlett-Packard, Co. has signed a three-year, \$75 million pact allowing McDonnell Douglas Corp. to bundle its Ungraphics software with HP's 9000 Series workstations based on Motorola, Inc. and reduced instruction set computing chips for resale.



Von Simson

CONTINUED FROM PAGE 43

chief, James Cannarino, he maintain that the relationship is sound. Fewer people are buying that line as time moves along.

According to many observers, Microsoft is increasingly impatient with its role as an OS/2 subcontractor and chafes at increasing IBM's lead on a number of development priorities.

And then there is Windows. Microsoft owns it and plans to make a great deal of money on it. As long as it competes with OS/2, the transition from DOS will never be managed effectively. The softness of any agreement between IBM and

Microsoft on the positioning of Windows and OS/2 is demonstrated by the wake of their Comdex announcement, which began to unravel almost immediately after the press briefing.

When OS/2 development began, the arrangement probably made more sense. Back in 1987, Microsoft was a much smaller company and would have been prematurely developed by the resources required to develop OS/2. It is now a great deal larger than it was in 1987 and is comfortable — perhaps too comfortable — in the role of leading the PC industry in standard directions.

Also, IBM's reasons for keeping such a tight rein on the project have largely evaporated. It felt that OS/2 and the voodoo of the Micro Channel bus would be

enough to keep the clone makers away. As it became obvious that it would not, the basic strategy around OS/2 changed: It was pushed not as the clone killer that it never was but as the advanced micro operating system of the connected future.

Now it is time for IBM to act on a lesson that it repeatedly claims to have learned: React quickly to let go of an obsolete plan and transform it into a structure that makes sense.

It is time for IBM to code OS/2 development to Microsoft. Not out of altruism but because the present system isn't working the way it should. As OS/2 becomes more readily accepted, the control of development by a single company will be increasingly important. The financial arrangements are easily worked

out, the personnel concerns somewhat less so. The net, however, is that after a difficult but workable transition period, OS/2 will have a single, stable direction for the future.

So, Messrs. Gates and Cannarino, find yourselves a reasonable price, settle the license agreement, shake hands and go in different directions. It just isn't a relationship that's right for either of you anymore.

Von Simson is a Computerworld West Coast senior correspondent.

286s

CONTINUED FROM PAGE 43

Development Co. go even further, insisting that users will need a minimum platform of a 386/SX with 3M bytes to 4M bytes of memory. Fidelity, for example, runs Windows on a 386 with 4M bytes or more of memory.

But that may not matter to some users. Microsoft claims that users can cut their training costs by moving to Windows, allegedly because they can get users accustomed to a graphical user interface on a lower cost platform. That investment, of course, will carry over to OS/2's Presentation Manager interface, especially given that the Windows 3.0 interface is supposed to mirror Presentation Manager.

"Once you get people used to the conventions of that concept, the training costs will go down," said Nancy McSherry, another IDC analyst.

That is still not enough to move users like Jude Gartland, a senior vice-president of the investment banking division at Shearson Lehman Hutton, Inc. It just does not make sense to pump more money into building a "super" 286, he said.

"Windows is a dead end," he added, noting that a key application for his group — Lotus Development Corp.'s 1-2-3 — does not run under Windows.

Gartland would rather spend the money on his long-term platform, the 386. "No one can cost-justify getting rid of 286s while they buy 386s," Peterson said. Also, Gartland does have a lot of 286s, which he said "keeps us from moving as a unit into things like OS/2."

So the recycling approach is attractive. The idea is to match users seeking to automate with departments looking to unload their 286s; dollars are swapped for the old technology and put toward the purchase of 386s. "In some sense, this costs the firm more money, but we're buying for the future," Gartland said.

Using an informal approach, Gartland's group has successfully diverted some 286s while adding to his stock of 386s, he said. Even where dollars cannot be swapped for boxes, it makes sense to hand down the 286 to other tiers within the office automation structure.

The following are popular "second careers" for the sturdy 286:

- Secretaries make a "good landing place," even with Windows, Diapera said. Typically, these users would have a spreadsheet, some word processing, a calendar and printer support.
- A function-specific server, such as a gateway server.
- A development platform.
- Users doing basic terminal emulation or word processing. Du Pont's fiber department prefers to move spreadsheet and graphics users onto the 386, Gilbert said.

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AT&T Paradyne

NEW PRODUCTS

Data storage

Exabyte Corp. has announced EXB-10 CHS, a desktop cartridge-handling subsystem that provides up to 50G bytes of unattended data storage.

Its incorporated EXB-8200

or EXB-8500 host software enables the product to provide respective storage capacities of 25G or 50G bytes in one square foot of space. An integral robotic cartridge-handling mechanism sequentially loads and unloads up to 10 8mm data cartridges.

Beta-test shipments of the

EXB-10 CHS are slated to begin in second-quarter 1990; production shipments are scheduled for third-quarter 1990. The price for single-quantity shipments (without drives and cartridges) to OEMs and system integrators is \$2,995.

Exabyte
1745 38th St.
Boulder, CO 80301
303-442-4333

OS/2 software

Above Software, Inc. has announced a PC-to-PC information exchange software program that allows DOS and OS/2 users to transfer information for less cost than by standard facsimile.

Above includes self-configuring installation and an icon-driven menu system that allows

users to transmit text and graphics files without any knowledge of file names, transmission rates or other communications protocols, the vendor said.

A program that includes both a two-unit pack for send and receiver stations and 3½- and 5¼-in. disk versions costs \$495.

Above Software
3880 Calle Comercio
Santa Ana, Calif. 92707
714-545-1181

Progress Software Corp. has announced that its fourth-generation language and relational database management system supports OS/2 operating systems and Presentation Manager.

Version 5 of Progress for OS/2 will run in OS/2 environments as single- or multiuser sessions; it also offers support for OS/2 Extended Edition, the vendor said. The product is available for \$1,250 to \$3,300, depending on configuration.

Progress
5 Oak Park
Bedford, Mass. 01730
617-275-4500

Software applications packages

Performer Systems, Inc. has announced Performer Version 1.1, an enhancement to its Time and Contact Management System software package.

Performer includes pull-down menus, advance records grouping techniques for a tickler file system, an autodialer and phone usage recording for inbound and outbound telemarketing. A hot-key feature lets users switch from one process to another and automatically return to the previous process, the vendor said.

Performer is priced at \$295 for a single-user version and \$695 for a multiuser version.

PSI
Suite B
161 S. Junipero Serra
San Gabriel, Calif. 91776
818-300-8570

Summation Legal Technologies, Inc. has released Version 2.0 of its Summation II litigation support software, a full-text handler integrated with a document summary database.

The update offers indexing for faster full-text searches, individual key fields that decrease sorting times, multi-entry and sortable note fields and look-up validation tables that provide greater accuracy in data input, the vendor said.

The program runs on an IBM Personal Computer XT, AT, Personal System/2 or compatible and can be carried into a courtroom on a portable unit. It is available for \$15.95.

Summation
Suite 2050
595 Market St.
San Francisco, Calif. 94105
415-394-9555

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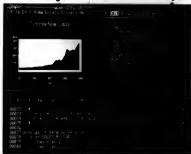
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Data General
Catalyst
Advantage
Program



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know data base terminology, and without sacrificing data base security. What's more, the SAS System's support of SQL* gives programmers a standard language for data query. The SAS System can also be used to access raw data files in any format — even files with messy or missing data.

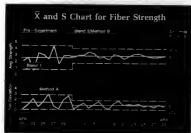
But getting data from place to place is just part of the challenge. Data management is also key, and the SAS System responds with efficient ways to enter new data...edit and query data files...and manipulate your data. You can even merge data from totally different kinds of files. And your inexperienced users can enter their data through customized fill-in-the-blank screens that look exactly like your business forms.



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Quarterly Investment Returns

Values by Fund Type

	Q1/80	Q2/80	Q3/80	Q4/80	Q1/81	Q2/81	Q3/81	Q4/81
Investment Funds	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000
Equity	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000
Fixed Income	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000
Money Market	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000
Real Estate	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000
Commodities	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000
Other	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000
Total	\$12,456,000	\$13,123,000	\$14,567,000	\$15,890,000	\$16,234,000	\$17,567,000	\$18,901,000	\$19,234,000

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NETWORKING

DATA STREAM

Thomas L. Nolle

Unintelligent networking



One of the things the Bell System divestiture was supposed to do for us was to advance the deployment of new telecommunications services through competition. One controversial way by which the Federal Communications Commission has attempted to do this is through Open Network Architecture (ONA).

ONA was meant to allow the Bell operating companies to introduce "Intelligent Network" offerings—that is, enhanced services such as videoconferencing, electronic mail gateways and centralized directories of information services—without using their monopoly of the local loop to throttle their competitors. Unfortunately, ONA in its present FCC-approved form is likely to throttle the enhanced service offerings of BOCs and potential competitors alike.

This is a shame because there is probably as much intelligent Network technology available today as Integrated Services Digital Network technology, at least in terms of potential. A recent survey showed that users were four

Continued on page 62

Users find frustration in bulky E-mail links

ANALYSIS

BY JOANIE M. WEXLER
OF TIME

The role of electronic mail has shifted from a mere convenience and productivity enhancer to a strategic communications backbone in many corporations, reaching beyond local boundaries to remote corporate locations and customer and vendor sites.

However, stretching electronic communication over a

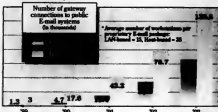
wide area has proven burdensome for some companies needing to link proprietary E-mail systems to public networks.

"The majority of E-mail users are looking to do transparent inter-enterprise messaging," noted Michael Connors, executive director of the Electronic Mail Association (EMA), a user and vendor consortium. "But it's fair to say that we're not completely there yet."

Bill Lawrence, a network engineer at Southern California Edison Co., an electricity utility

The mail must go through

Gateway connections to public electronic mail systems are projected to almost double annually



Source: International Data Corp.

CW Chart: John Turk

in San Clemente, Calif., noted that "most E-mail packages don't deal well with connectivity;

the vendors haven't yet made them completely transparent."

Continued on page 62

Trump-eting use of wireless terminals

ON SITE

BY ELLIS BOOKER
OF TIME

ATLANTIC CITY—Win or lose at the blackjack tables, diners at the Trump Taj Mahal Casino Resort can bet on a speedy meal.

Waiters and waitresses at two of the 12 restaurants in the glittering gambling casino that opened last month will use handheld radio-frequency data terminals to send food orders from customers' tables to the kitchen.

The handheld units are part of a \$1 million contract with NCR Corp. for point-of-sale systems at the casino resort, which opened two weeks ago amid characteristic Donald Trump excess and media hoopla.

A total of 48 NCR Hand-Held Order Entry Systems have been deployed. They are linked to a personal computer-based system, the NCR 2760 Food Ser-

vice System, which prints or displays incoming orders for codes and generates detailed management reports. In turn, this system communicates, over con-



Taj Mahal staff relays orders to kitchen via handheld terminals

ventional wiring, with an NCR point-of-sale computer at the cash register station, which prints out the guest check.

"The rationale is to get orders passed along quickly and accurately," said Taj Mahal Vice-President of Administration Tom Adams. Adams, who spent a year looking into the viability of the data terminal approach, said he expects "a very successful rollout" and hopes to move the movable data terminals into other parts of the 17.3-acre complex, such as the four bars and lounges and the pool bar area.

While some workers may resist giving up their time-honored pencil and paper, the use of handheld terminals for restaurants and other retail establishments is expected to accelerate, according to observers (see story page 60).

The handheld units, made for
Continued on page 60

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McDATA

McDATA

Keeping control of the big ones

Wide-bandwidth networks help handle multigigabyte files

BY JIM NASH
CQ Staff

A megabyte's just not as big as it used to be.

Files as large as 1 G byte are not only more common outside the world of technical research, but they are also more mobile. Moving these lumbering files without interrupting all other work flow has become a top priority for information systems professionals.

Witness LSI Logic Corp. in Milpitas, Calif. LSI designs and makes application-

specific integrated circuits. Simple initial design files rapidly swell to gigabyte status and yet must be transferred with the dexterity of a cardsharp shuffling a deck of cards.

For dexterity approaching that level, Dennis Anderson, LSI's manager of computing systems, turned to Ultra Network Technologies, Inc. The San Jose, Calif.-based company makes a family of superfast networking software and hardware products that are collectively known as Ultratnet.

Ultratnet boasts effective bandwidth

starting at 1 G bit/sec., said Pat McEntee, Ultra Network's marketing manager. It increases channel capacity from 4.5M byte/sec. to 36M byte/sec. with an IBM-compatible system.

Ultratnet connects a variety of hardware, including systems from Sun Microsystems, Inc., IBM, Cray Research, Inc., MIPS Computer Systems, Inc. and Fujitsu America, Inc. as well as Digital Equipment Corp.'s Decstation 5000.

LSI has been using Ultratnet products as a backbone for some of its 80 Sun 3/280 and 4/280 file servers. The servers support 450 Sun workstations on 24 Ethernet networks. Sixteen of the networks are now linked by Ultratnet; all 24 will eventually be connected.

Anderson said he had used Sun's gate-

ways to link the company's IBM 3090 Model 3003 with the Ethernet networks that support the workstations. Now Ultratnet connects the networks. Anderson continues to use the gateways in conjunction with Ultratnet to provide IBM 3270 emulations for the workstations.

Anderson said he figured that users previously were running the Ethernet networks at 80% of their capacity. The result was a collision ratio of 10% to 15%, he said. In short, LSI was bringing the system to its knees.

Last September, LSI decided to go with Ultratnet. Anderson said, and soon brought network utilization down to 25% to 30% of its total capacity.

Anderson noted one problem that occurred about three months after Ultratnet was installed. The network would go to sleep, or partially shut down, at random intervals, he said.

It was determined that network link adapters would occasionally stop responding. He said Ultra Network has since remedied the problem by replacing software in network adapter cards.

Getting into print

Because the need for sophisticated graphics capabilities has spread beyond highly technical purposes such as computer-aided design, superfast networks can, surprisingly, be found in industries such as publishing.

John Mercer, pagination director for the Houston Chronicle, said he foresees the collisions and bottlenecks that would occur on an overburdened workstation network. He needed enough throughput to handle the combined weight of display and classified advertisements and word processing on a batch of workstations [CQ, March 19].

Mercer has coordinated a four-year project that will organize all editorial and advertising work on a Sun/Ethernet/Ultratnet system.

Last fall, the paper began connecting its 10 Sun 4-280 file servers, 100 Sun 3/60 workstations and 100 Visual Technology, Inc. X Window terminals via the Ultratnet 250 hub.

With bandwidth starting at 1 G bit/sec., Ultratnet provides more capacity than the Chronicle has horsepower. However, Mercer said, he anticipates such power from Sun systems in the foreseeable future. Right now, that capacity means fewer bottlenecks and greatly increased file-transfer speed between servers.

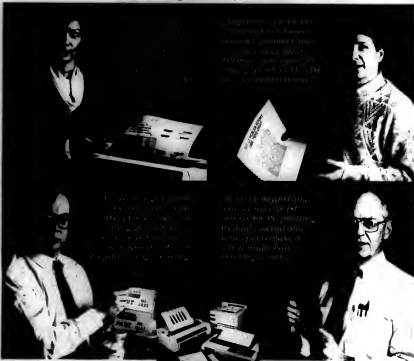
Mercer said the paper is currently installing an Ultratnet 1000 hub both to include the Chronicle's IBM 3081 in the network and to accommodate planned network expansion.

He said it was Ultratnet's power that sold him. "I don't know of anything else with a gigabit-per-second throughput." That load may sound massive for noncommercial uses, but for Mercer it is just what the doctor ordered.

"We always have one redundant file server, and sometimes two," he explained. "A lot of our data is graphic. We need to move a lot, keep the redundancy and not choke down the users."

Mercer said he had some difficulty installing the network. "It wasn't a plug and play," he said, but "it was no more painful to install than we expected it to be." It took two or three weeks to get the system installed and operating. The most difficult part bringing it on-line was getting all the kernels in sync and working together, he said.

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Radio retailing on the rise

Of the annual \$800 million business in handheld data terminals, radio-frequency units account for about \$100 million to \$125 million, according to Prudential-Bache Securities, Inc.'s First Vice President E. Garry Glass III.

While diners at New York's swank Four Seasons restaurant are unlikely to see waiters and waitresses with handheld terminals anytime soon, the devices may be increasingly popular for those chains "between a fast-food place and an upscale restaurant," where speed and efficiency is an issue, Glass said.

Glass also predicted that radio-frequency applications will grow because large players are working to introduce new products. "They'll let you get a receipt and sign for a meal right at the table," Glass said.

Market leader Telxon Corp. in Akron, Ohio, for example, does 30% of its \$160 million business in radio-frequency handhelds. A spokeswoman said Telxon is working on a device with an integral credit-card scanner and a printer. Such devices, Glass said, will enable customers to make purchases anywhere in a store.

Trump

FROM PAGE 55

NCR by Seiko Co., weigh just a few ounces and open wallet-like to reveal function keys and a two-line LCD screen.

In addition to sending an order from the table, the data terminal interacts with the base station to prompt the waiter or waitress through an order. For example, after a customer asks for a New York steak, the terminal asks the waiter to choose a second function key corresponding to a degree of doneness indicated on the second line of the LCD.

Of the two restaurants, the 348-seat New Delhi Deli, with its neon lights and high-tech feel, would seem at first the bet-

ter-suited for the data terminals. By comparison, the 417-seat Bombay Cafe coffee shop is fashioned after the Brighton Pavilion in England, complete with marble floors, carved glass and crystal chandeliers.

According to Adams, however, the terminals are "a fairly cut-and-dried application of technology to solve a problem... in our case, how to get food to a customer."

The Trump casino, now the tallest building in New Jersey and christened the "Eighth Wonder of the World" by Trump publicists, was inspired by India's famed Taj Mahal and includes carved stone elephant statues at its main gate and a roof adorned by no fewer than 70 colorful minarets and onion-shaped domes.

BIT BLAST

Firms join forces to offer ISDN

Avatar Corp. and H-Three Systems have announced an agreement to integrate and co-market Apple Computer, Inc. Macintosh-to-IBM mainframe connections based on Avatar's Macmainframe Series IBM 3270 emulation software and H-Three's Macring token-ring cards.

J. C. Penney Business Systems, Inc. and Citgo Petroleum Corp. are among those participating in a trial of BellSouth Corp.'s proposed Fastconnect service, which is designed to lower the cost and time required to verify point-of-sale transactions. Northern Telecom, Inc. and Integrated Network Corp. are among the equipment vendors whose products will help BellSouth deliver the service, which is said to support simultaneous voice and digital data transmission over a virtual private network.

International Computers Ltd.'s North American Networks Industry Division and Ameritech Information Systems, Inc. recently signed a two-year contract under which they will offer Ameritech customers Integrated Services Digital Network systems, applications and communications software.

Nippon Telegraph and Telephone Corp. has invited suppliers to participate in the research, development and procurement of an asynchronous transfer mode (ATM) node system and ATM link system for broadband ISDN, which will allow such services as video communications in the public network.

Twenty-four computer networking companies have said they will participate in the Simple Network Management Protocol demonstration at Intersec 90, slated for Oct. 8-12 in San Jose, Calif. SNMP is a network management software protocol used in Transmission Control Protocol/Internet Protocol nets.

Advanced Computer Communications (ACC) recently announced a basic ordering agreement with Digital Equipment Corp., under which DEC can purchase ACC data communications products and services, including the ACS Series 4000 family of bridges, routers and network management products.

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Unisys airs Unix-based EDI software

BY ELISABETH HOWITT
OF WASH.

BLUE BELL, Pa. — Unisys has announced software that positions its U 6000 series Unix-based computer line as EDI front ends that allow "virtually any system" to transmit business documents using electronic data interchange (EDI) formats, according to Unisys program marketing manager, Tom Castello.

The overall U.S. EDI market is expected to grow from \$187 million in 1989 to \$1.1 billion in 1994, according to The Yankee Group, a Boston-based research firm. However, overall demand for EDI software, which enables users to do their own EDI communications, will make up only a little more than one quarter of the market by that time, the company predicted.

One main reason is that EDI services, provided by third vendors as GE Information Services and IBM Information Network, appeal to those companies that

do not want the expense and bother of setting up their own EDI translators and front ends, according to Gigi Wang, director of data communications research at The Yankee Group. Such services not only translate documents to multiple, industry-specific formats but also act as post offices that manage delivery of documents to the right destination.

Important network added
In addition, the network services are adding value to their EDI offerings with integrated electronic mail and facsimile delivery, Wang said. Such services are of particular importance to the growing number of users that are exchanging documents with companies in other industries and overseas, she added.

The first part of Unisys' introduction was Easy Access Data Interchange Plus (Eadplus) software. Eadplus is said to allow a U 6000 to act as a centralized EDI server that takes in any document an application can

send as a flat file and maps it into a format that can then be handled and transmitted by the user's choice of EDI translator, Costello said.

An "open" version of Unisys' Easy Access Data Interchange Plus systems only, Eadplus allows the EDI platform to accept data from other vendors' systems using a wide range of networking protocols, the vendor said. Notable among the protocols supported are IBM's Systems Network Architecture 3770 and Transmission Control Protocol/Internet Protocol (TCP/IP). In addition, a customizable interface enables users to adapt whatever communications protocol they choose, Unisys said.

The second part of Unisys' EDI announcement consisted of a U 6000 version of Telink/Open Systems Architecture (Telink/OSA), an EDI systems management and translation software package from EDI, Inc. that formerly ran under Microsoft Corp.'s MS-DOS.

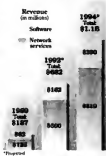
While EDI's product is the only one that is directly supported by Eadplus and marketed by Unisys, it only takes minor adjustments to interface Eadplus with any of 40+ translators now being marketed in the U.S., Costello said. Such translators

support one or more versions of EDI formats, including ANSI X12, the mainstay of retail and industry-specific protocols.

By supporting multiple EDI formats as well as multivendor hosts in one server, Unisys' platform does away with long-standing obstacles that hampered users' adoption of EDI, Costello said.

Transition time

The U.S. market for EDI services and software is set to triple and then almost double again



The product also provides advantages through being Unix-based, when most existing EDI platforms are based on either IBM mainframes or MS-DOS, Wang said. One advantage is that Unisys' product is better suited than MS-DOS systems — or IBM hosts, for that matter — to act as an EDI server for multiple, networked systems.

Second, the platform can tap into the demand for EDI communications from a growing number of applications running on Unix systems over TCP/IP networks, Wang said.

Eadplus is priced between \$14,000 and \$40,000, depending on hardware configuration. Telink/OSA's price starts at \$9,000. Both products are due to ship in August.

Nolle

FROM PAGE 55

times an increase in intelligent network services as in ISDN.

"We've made significant progress at the technical level, certainly enough to justify advanced planning and trials, and four years have passed since ONA was proposed.

So where are all the services?

The sad answer is they are mired in politics and regulations.

In essence, ONA required the local exchange carriers to offer advanced services only where the Basic Service Elements on which those services were based were open to other Enhanced Services Providers, at costs comparable to those which local exchange carriers were charging themselves.

The problem is that just as AT&T suffered from having to disclose its tariffs ahead of time, the BOCs have feared that they are giving away far too much strategy. "We tip our hand in service planning as soon as we file an ONA plan," one BOC planner complained, "then get attacked by the people who want to compete with us."

To put the BOCs at even more of a disadvantage, they have to implement expensive technologies, such as Synchronous Optical Network, advanced signaling and enhanced computer-to-switch interfaces, to provide local intelligent network services at a cost and quality that will create demand.

However, ONA actually provides carriers with a motivation

not to implement intelligent networks. The problem is this: ONA grants competitors the right to demand access to that same technology at a cost that will let them charge their users the same rates that the BOCs are charging.

Add to this the uncertainty of the market for these enhanced services, and you can see why the BOCs are reluctant to make that initial, expensive outlay when all they are doing is paving the way for competitors.

This means that no one gets the technology needed to support those services on the local loop.

To make life even more difficult for the BOCs, they must get their proposed services through not one, but several regulatory bodies. The FCC, the Federal Communications Commission of U.S. District Judge Harold R. Greene and the state Public Utility Commissions all have some role in the approval of carrier services.

Fifty different regulatory perspectives are involved in this, even when the "one" perspective of the FCC seems more a request for self-help than an attempt to create a proper climate for network services development.

What is really needed is federal legislation to remove control from the hands of the judiciary and to lay out a national telecommunications policy that will encourage the development of new and advanced applications for communications.

Nolle is president of CIME Corp., a communications consulting company based in Worcester, N.J.

E-mail

FROM PAGE 55

For Lawrence, the use of E-mail is strategic in that "we are a nuclear power plant, so the need for safety dictates that we communicate quickly, yet in a precise manner." Commercial companies, such as clothing retailers, use offshoring production sites. E-mail to overcome time-zone communication barriers and slash decision-making and production turnaround times.

Roger Klutke, a senior communications consultant for Ralston Purina Co., is planning to use an IBM Officevision application to interenterprise E-mail, primarily for distributing pricing updates and recent notifications to remote sales and warehouse locations.

"The biggest headache for interenterprise communication is that standards don't really appear to be standards in some cases," he said. "For example, the transmission size of X.400 is 32,500 bytes. The traditional IBM transmission is Systems Network Architecture," he said. X.400 is the CCITT standard for E-mail that is included in the application layer of the Open Systems Interconnect (OSI) protocol.

Tom Cross, chairman of Cross Market Management Co. in Boulder, Colo., added, "While carriers are linking their E-mail networks, they haven't really addressed the user interfaces. Currently, you have to dial a local number, make sure you're talking to each other and use a communications software package. It's not simple, like a fax machine."

Progress is being made, however. The X.400 Application Protocol Interface Architecture (APIA), founded in December 1988, is working toward providing a public-domain de facto standard for linking both proprietary messaging systems and application programs to X.400 servers, which would in turn communicate directly with public mail system, according to David Knight, former chairman of the APIA and director of market development at Retix, an OSI internetworking company.

Knight predicted that there will be half a dozen application programs with X.400 server

hooks shipping by September.

He also pointed out that the commercial use of X.400 compatibility is strongly tilted to the Government Open Systems Interconnect Profile, a mandate by the U.S. government that all federal agencies communicate using OSI protocols as of August 1990.

There are an estimated 120 private carriers, a growing number of public carriers via X.400 today, which could grow to 250 by the end of the year, according to Mike Zisman, president of Soft-switch, a supplier of enterprise E-mail networks. Cavanaugh noted that there are about nine million E-mail users worldwide.

And miles to go . . .

One industry analyst sees the electronic world as having some distance to go before it can offer a full range of strategic benefits to users.

"There's still no real sense of an electronic system handling all the information that's in your in-box," said David Taylor, vice-president of interenterprise systems at Stamford, Conn.-based Gartner Group, Inc. "But we're working toward treating, say, an invoice or electronic message as an object that we can track in an X.400 envelope."

X.400, a CCITT electronic mail standard, has traditionally been implemented to connect one E-mail vendor's system to another across a public network.

Taylor explained that electronic data interchange (EDI) — the computer-to-computer transfer of business transactions — is a major contender for insertion in an X.400 envelope. "But you'd be putting one envelope inside another one already capable of moving data between sites," he noted.

Taylor added that "some of the more advanced applications for combined E-mail and EDI are hung up because users bear the brunt of the conversion. It costs hundreds of thousands of dollars for every application they have to integrate."

Taylor noted many of his clients complain that they "don't see the point of having all these new technologies unless you can bring them all together. Users are forced to become systems integrators, which should be the vendor's job."

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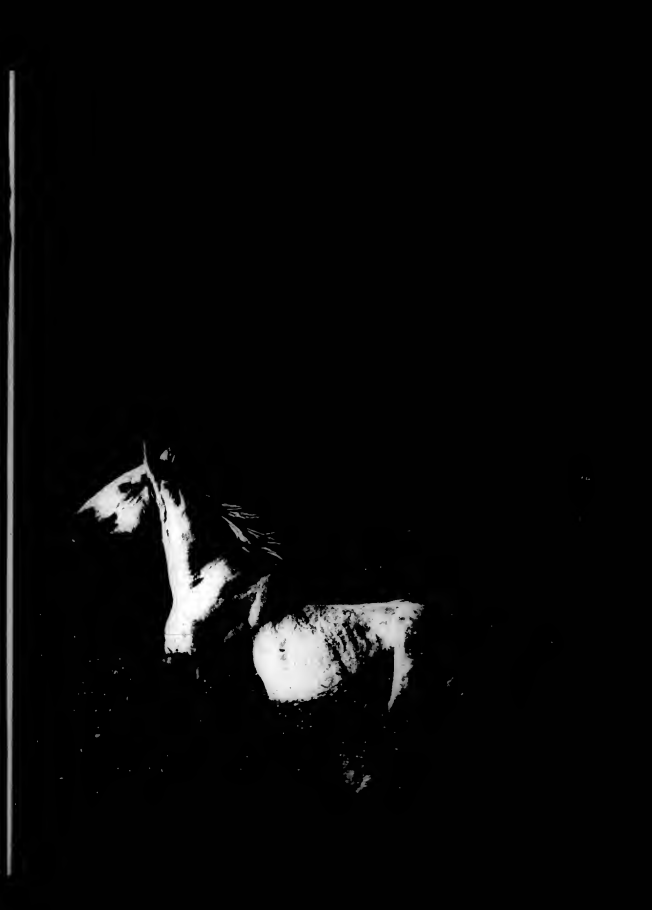
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MANAGER'S JOURNAL

EXECUTIVE TRACK



The Beacon Companies of Boston have named Dennis Pyburn to the post of vice-

president of management information systems. Pyburn, who joined the company as director of MIS in 1986, has more than 10 years of experience in IS management. Previous jobs Pyburn has held include MIS director at Ventron, a division of Morton International, Inc.; director of MIS at Howe & Bainbridge, a division of Dexter Corp.; and director of MIS at Town & Country Corp. In addition, he spent two years at Digital Equipment Corp. as a senior business systems analyst.

Pyburn holds bachelor's and master's degrees from Lesley College in Cambridge, Mass., and is a member of the Association of Systems Managers. He and his family reside in Danvers, Mass.

Martin Powers recently joined the Wakefern Food Corp. in Edison, N.J., as senior manager of data processing services. In his new position, Powers will be responsible for systems programming and communications, as well as data processing services.

Powers holds a bachelor's degree in accounting from Northeastern University and an MBA in accounting and computer sciences from New York University. Previously, he worked for Supermarkets General Corp. in Woodbridge, N.J., for 20 years.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going. And *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to: Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochin Road, Framingham, Mass. 01701-9171.

Centralization is his calling card

Ameritech's Arnold slashes costs, increases flexibility by consolidating data centers

BY ELLIS BOOKER
ON STAFF

From his office on the 28th floor of Chicago's Merchandise Mart, Ameritech information systems chief Glen Arnold can look down and see work progressing on a building that will house one of the four mammoth data centers Ameritech will use to consolidate its five-state data processing operation.

But reducing the number of data centers from 14 to four is only one of the projects that requires Arnold's attention.

As president and chief executive officer at Ameritech Applied Technologies, Inc., the 2-year-old IS arm of \$10.2 billion Ameritech, Arnold must convert an oil tanker into a speedboat as he prepares the company's IS department for a time in the near future when public network customers will order, configure and largely control their voice and data services themselves—from workstations.

Preparing for this future and designing a flexible IS staff that will make it possible is no small task at a regional Bell holding company.

Like the other six regional Bells, Ameritech continues to deal with the 1984 breakup of AT&T, the big bang in the history of the U.S. telecommunications industry. Virtually overnight, Ameritech found itself an independent entity, managing territories and resources that had been carved out of the century-old Bell System.

The data center consolidation project — the number of logical centers has already dropped from 21 — is the

PROFILE: Glen Arnold



Position: President and CEO, Ameritech Applied Technologies, Inc.

Mission: To prepare IS for a future in which public network customers will control their own data services

most obvious example of how Ameritech is working to centralize and standardize the hodgepodge of systems at its five telephone companies — Illinois, Wisconsin, Indiana, Michigan and Ohio Bell.

Ameritech officials said they hope the five-year endeavor will reduce the company's long-term processing costs

by an impressive 20%.

Applied Technologies began operations in October 1988 with Arnold at its helm. The decision to centralize the IS organization was made on the recommendation of a task force that assessed Ameritech's IS infrastructure in mid-1987.

Continued on page 66

Are you setting yourself up for a fall?

BY ALAN J. RYAN
ON STAFF

Ever had one of those days when users are griping that a promised system is late, the old systems are obsolete and they'll have your head on a platter if you don't do something about it soon? You're working 15-hour days, and you still can't seem to get ahead of your work load?

You're not alone. And your thoughts are not original if you've been musing that it might be nice to get fired to end the misery, or so says an informal study by an international outplacement consulting firm.

In fact, the findings of Challenger, Gray & Christmas, Inc., based in Chicago, have shown that there are a lot of managers who are committing work-place "bari-kari."

"The managers we see are reacting

to the rapidly increasing demands being placed on them by literally creating conditions that lead to their own discharge," said James E. Challenger, president of the outplacement firm. "Such people prefer to be discharged rather than taking the initiative to quit a job."

Constant expectations

While Challenger said the scope of the workplace bari-kari encompasses all disciplines in all job levels in all parts of the country, it is often more apparent in areas such as information systems, in which workers are constantly expected to provide tangible and easily measured results from their work. "The finger gets pointed in any field that is easily measurable," Challenger said.

Another reason IS managers might tend to get themselves fired more often than their general business coun-

terparts, Challenger said, is because some are still under the mistaken notion that getting a job in the IS field is as easy as it was five or 10 years ago. Challenger said that when managers consciously or subconsciously do things that lead to being fired, they are simply creating another set of problems — explaining to a new employer why they left the last position.

"Saying that the last company expected long hours of work is not an answer that will sell a prospective employer," Challenger said. In fact, "complaining in any way about a past employer, in any manner, ranks as one of the worst mistakes a job candidate can make during an interview."

Additionally, Challenger said that people who leave one demanding job seeking an easier work load at the next are unlikely to find such a job without accepting a downgraded salary and downgraded position.



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Corporate camps divided over use of IS potential

BY ALAN J. RYAN
OF STAFF

NEW YORK — It is not likely to come down to taking it out in the boardroom, but a recent study of information systems executives and other senior managers has found a substantial gap between how those two sets of workers view their companies' use of IS.

The study, conducted by Beta Research Corp. for *Forbes* magazine, found that within the nation's largest companies, 58% of the top IS and communications executives polled believed their organizations are using computing to its fullest potential, but half of the non-IS senior managers said that simply is not so.

The survey also showed that as more top non-IS executives have gained computer skills, they have become more involved in their companies' technology investment decisions. Fifty percent of the respondents said they were personally involved in purchasing or leasing of computer and communications equipment, and services, and 54% said they were knowledgeable or expert in

understanding of computers.

That may be partly because of the use of the equipment. Half of the respondents said they have computers both at home and at work.

Additionally, slightly more than one-third of the respondents said their companies' decisions to purchase or lease computer and communications equipment are made by committees, which include both IS and non-IS managers.

In many of the companies polled, the position of vice-president was cited most frequently (45%) as being responsible for the purchasing or leasing of computer and communications equipment and services, followed by president/chief executive officer or chairman at 21% and chief financial officer at 15%.

The study was mailed to 2,000 IS and non-IS executives in the 1,500 largest corporations across the country. Nearly 90% of those polled said their companies have annual sales revenues of \$500 million or more. The results were compiled from 799 completed responses.

Arnold

FROM PAGE 63

"Clearly, there was duplication of effort," said Arnold, noting that each operating telephone company had large IS staffs devoted to maintaining unique applications, some of them 20 to 25 years old.

Arnold joined Wisconsin Bell in 1985 after 13 years at IBM as a marketing executive — a background that he said he views as a plus.

"I force the technical side of business to look at what we do from a customer perspective. I think that's an advantage," said Arnold, who looks and often talks like a friendly college football coach.

Applied Technologies was formed with 2,800 staffers pulled in from the five operating companies. But in a move at once technologically ambitious and managerially insightful, Arnold left many of these workers where they were rather than relocating them to the Chicago corporate headquarters.

"The unique thing we did was to leave the people out there," he said. The two obvious advantages were that a large number of workers avoided having to relocate and that the state opera-

tions didn't lose talented workers.

However, Arnold saw a third advantage: "It forces us to use telecommunications to connect everybody up. It forces us to showcase what we sell," he said, adding, "We've got to do for Ameritech what Ameritech can do for other customers."

One application of this networking know-how — what Arnold called "electronic teaming" — is being used on Ameritech's oldest and largest IS project, the revamping of its customer information systems into a powerful database, order-entry and transaction processing system.

During the past 14 months, the 1,500-person systems development group at Applied Technologies has been restructured to focus on different projects. However, staff members have begun to share a common systems-development environment based on a series of databases and data dictionaries that will ultimately reside in two of the consolidated data centers.

Tying the data centers together is the Ameritech Intelligent Corporate Network, a high-speed backbone network that only last month officially opened the first of its two network management centers.

Between October 1990 and

January 1991, Applied Technologies expects to grow by 900 employees to reach a total of 3,700 people, as it takes on responsibility for managing the data centers, now run by a staff of 2,200.

Officials at Applied Technologies said they believe the company will eventually be able to run the four data centers with just 700 full-time workers.

Meanwhile, Arnold must hammer out corporatewide IS policies such as computer-aided software engineering requirements and standards for terminal hardware. There are approximately 66,000 terminals inside Ameritech, of which perhaps 15,000 (including the Apple Computer, Inc. Macintosh II on Arnold's credenza) are intelligent workstations.

To keep track of the activities of the systems inside the operating units and emerging computer technologies there is the monthly *I/T Policy Review Board*.

"By 1991 we want to have our arms around RISC technology," Arnold said.

Arnold is also a member of the Office of the Bell Group, a decision-making body composed of the presidents of the Bell companies that meets each month to discuss general business issues.

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THIRD ANNUAL SERIES

According to Mark Hauf, assigned this month to the post of vice-president of technologies at Ameritech and one of Arnold's lieutenants responsible for the creation of the AAT game plan, three technologies will be key: large-scale database systems, end-user technologies and process control applications.

"Think of a telephone company as a manufacturer," Hauf suggested. "Our factory floor is the network, and our product is the use of that network." Continuing the analogy, Hauf said Ameritech needs its own version of computer integrated manufacturing, whereby information systems reach from the process control of a device on the factory floor to the back-office accounting system.

Why does a phone company need this level of automation? Hauf described a future in which telephone company customers routinely dial a number and interactively request network services, when "real-time provisioning of services" will be common.

Although confident that the various integration projects will go smoothly, Arnold admitted there may be reasons to reassess the strategy, among them drastic

changes in technology or the business environment.

"Everything we do involves risk, but the way to minimize it is through good, solid planning," he said, noting that the data consolidation plan was in development for almost a year before it was approved by management.

"The flip side is project management," Arnold continued. "We constantly audit projects as we go."

Finally, Arnold noted that Ameritech cannot tell its 12 million residential and commercial customers to stop requesting service for a year while it gets its IS house in order.

"One of the things we have to do while re-architecting the future," he said, "is keep the business running."

CALENDAR

MAY 6-12

Strategic Information Systems Executive Briefing, Los Angeles, May 6 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Midday Week Session Workshop, Indianapolis, May 8-10 — Contact: Indiana Labor and Management Council, Indianapolis, Ind. (317) 725-4161.

Portable Computing and Communications '90 Conference and Exposition, Anaheim, Calif., May 9-10 — Contact: Conference Sales, Framingham, Mass. (800) 235-4006.

The Hardware Software Conference, Monterey, Calif., May 9-11 — Contact: Digital Consulting, Astoria, Mass. (508) 470-3888.

MAY 13-19

Management Systems Council of the American Building Association National Conference and Computer Exhibition, Las Vegas, May 13-16 — Contact: MTC, Alexandria, Va. (703) 836-1731.

Share 74.8, Kansas City, Mo., May 13-16 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6616.

International B2B Users Group Conference, Chicago, May 13-17 — Contact: IBUG, Chicago, Ill. (312) 644-6616.

Comprehensive MVS/ESA and ESA Performance Management Seminar, Los Angeles, May 16-18 — Contact: L&S Computer Technology, Austin, Texas (512) 958-3811.

Keeping in touch

Charged with developing and maintaining the information systems throughout Ameritech and its five operating telephone companies, Ameritech Applied Technologies has its fingers in many pies.

However, as IS chief Glen Arnold noted, the work must go while Ameritech provides primary network service to 12 million residential and business customers.

Major systems integration projects under development include the following:

- The Ameritech Customer Information System, which will replace the separate Customer Record Information System in use at the five operating companies. ACIS is designed to be more than a comprehensive customer information database; it will automate activities such as the ordering of services by customers and the provisioning of those services by Ameritech engineers and technicians. It is due to go live in the 1993-1994 time frame.

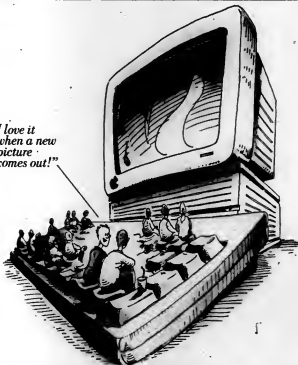
- The common systems evolution plan. Ameritech's in-house applications are currently dominated by Cobol and assembler code. But IS officials state that IBM MVS and client/server architectures — likely with Unix servers — are the future for its host and departmental computing needs.

- In addition, Ameritech will begin demanding ISO Open Systems Interconnect-compliant solutions from its vendors within the next 19 months.

- The Ameritech Intelligent Corporate Network. The backbone T1 network will link the four "mega" data centers that will consolidate Ameritech's data operations across its five-state territory.

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Dan Roberts and
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Keep in mind is this era of cost reduc-

tion that the best price is not always your best option. Before entering into new partnerships, check references to find out how the vendor you're considering has improved its product or service recently. Invest a little time up front to investigate your vendor — it will help you save in the long run.

Once you've selected a partner, orient it to your business as you would a new employee. One progressive information systems organization writes an annual report for its specific IS products and services. One of the many uses of this tool is to orient its new vendors, thus shortening the learning curve and providing an immediate impact.

Here are some guidelines for dealing successfully with vendors:

- Watch out for the bait and switch. This technique has historically been used by vendors to entice you to buy at bargain prices. Once you're hooked, the price goes up.
- Don't burn bridges. The vendor you blow off today may be the one you need to go back to in the future.
- Don't cry wolf. Plan your work with your partners. Keep them involved and give them time to do their part. Don't wait until the last minute to place your order; not only does this make the vendor a less willing partner, but it also increases the price of the project and decreases the likelihood of its success.
- Watch the peaks and valleys. Plan your work so it coincides with your partner's slow periods. This can decrease turnaround time, increase service to you and reduce the price you'll pay.
- Don't abuse your power as the buyer. Build a give-and-take relationship for mutual benefit. It's very costly to find a new partner if you lose an existing one.



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WHEN YOU CAN, reward your partners with additional business and referrals. This gives them an added incentive to come through for you — or even exceed expectations — in the future.

- Reward your partners. Make sure your partners don't receive only negative feedback, such as when things go wrong or a deadline is missed. Show your appreciation of a job well done; make sure you tell your partners when they've done well. When you can, reward your partners with additional business and referrals. This gives them an added incentive to come through for you — or even exceed expectations — in the future. Don't attempt to win them over with fluff, false praise or empty promises. A true partnership is built on trust.
- Become genuinely interested in your partners. Ask them about their businesses, families, hobbies and other interests. They will in turn become interested in your needs and look forward to seeing and serving you.
- Prioritize your priorities. Make sure your partners know what's most important to you in every job or project. Rank quality, price, service, speed and other factors in realistic terms so your partners fully understand your needs and can deliver a product that's right on the money.
- View vendors as consultants. Seek the professional advice of your vendors. As they learn about your business, they may be able to offer helpful suggestions that you and your co-workers overlooked.
- Your vendors will feel good about being heard and will be encouraged to take an even greater interest in what you do. As a result, they'll be an even greater asset in helping you meet your own business goals.

Roberts is vice-president and Gould is marketing director of Quellwitz & Associates, Inc., a Bedford, N.H., training and consulting firm dedicated to developing the human side of technology and building service-oriented IS organizations.

CLIPS



The Lane

Summaries from leading scientific and management journals

Sloan Management Review Winter 1990

"Technology in Services: Creating Organizational Revolutions" and "Technology in Services: Rethinking Strategic Focus" By James Brian Quinn and Penny C. Paquette

■ To unlock information technology's bottom-line benefits, a services company needs to study what it does for its customers and how. It can then apply information systems tools to the smallest repeatable task to improve the speed and efficiency of workers at the customer contact level — the point at which most of a service company's perceived value is created.

This automation process will redefine a company's internal structure in one of three ways. The organization may become inverted: Managers will now "work for" clerks to ensure that they have all resources necessary to satisfy the customer. Or the company may develop a lateral staff formation, in which the number of people at essentially equal levels is limitless. Such an "infinitely flat" organization is guided by a central system that delivers customized information to remote points. Or the staff may form a "spider's web" organization in which each person in the web requires information or help from virtually all other members to get the job done. This information-sharing heightens the individual's motivation to solve customer problems.

Besides changes in organizational strategy, new service technologies can change a company's strategic thinking. With technologies providing economies of scale, efficiency and flexibility, firms can consider outsourcing certain functions to outside vendors, enhancing value and lowering costs.

However, an organization must manage outsourcing conditions so it does not become overly dependent on and dominated by its partner. To stay in charge, a company may have to develop and maintain alternate competitive sources or retain control over critical areas in an overall process that might otherwise be totally outsourced.

MIT's Technology Review April 1990

"The Software Patent Crisis" By Brian Kahin

■ The cost of doing business in a software patent environment will radically restructure the software industry. Many

small companies will fail under the costs of licensing, avoiding patent infringement and defending their patents.

The environment will be hostile to individual software entrepreneurs and inventors with limited funds. There will be fewer publishers and fewer products, and the price of software will rise to reflect the cost of researching and defending patents.

Especially disturbing is that many recent software patents appear to establish monopolies on the automation of such common functions as generating footnotes and comparing documents. Some claims even cover processes for presenting and communicating information, raising troubling questions about the future of computer-mediated expression.

Indiana University Graduate School of Business Working paper

"Expert Systems Projects: Factors for Successful Implementation" By Dave Dibble and Robert P. Bostrom

■ Businesses are investigating expert systems because of the scarcity and geographic limitations of expertise, coupled with the tirelessness of machines. However, expert systems technology has development and management characteristics of its own.

For example, there are issues in expert selection, such as whether to use a

single expert or multiple experts. Real-world problems often border on several areas of expertise, but using multiple experts who have different approaches to solving the same problem would lead to inconsistencies in the knowledge base. Also, the degree of commitment shown by the expert toward the project is one variable critical to the project's success.

The issue of maintaining the expert system after it has been deployed has been virtually ignored. The key questions are: Who should do it? How will they be trained? What are the most cost-effective maintenance techniques? What if support structures are needed?

If expert systems are to become viable business systems, they will have to achieve some degree of manageability.

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EXECUTIVE REPORT

FORGING CONNECTIONS WITH BUSINESS PARTNERS

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Adding new players can change rules of the game

BY LARRY STEVENS

When companies join forces with outside partners — be they suppliers, distributors or industry peers — the lines between participating organizations often tend to blur at points of contact. Harvey Shrednick, vice-president of information systems at Corning, Inc. in Corning, N.Y., knows all about this phenomenon. It has, Shrednick says, changed the essential nature of his department.

Corning is a company that prides itself on having a large number of strategic alliances and joint ventures. According to Shrednick, what that has meant for the IS department is transformation from a strictly in-house operation to something more like a service company, providing IS services to some joint-venture companies and buying IS services from others.

"We have to stand ready to offer services to clients that are outside our walls," Shrednick says. "That means we have to determine cost, negotiate rates and send out bills — things we never had to do when we just served our company."

While not yet commonplace on the U.S. business scene, alliances of various types are starting to crop up in a number of industries as companies seek greater efficiency in production, marketing and research and development investments.

These arrangements differ from mergers and acquisitions in that while equity investment is sometimes involved, the real purpose is not ownership but a leveraging of skills and resources for a joint goal or enhanced coordination between organizations along a supply chain. They range from links between suppliers and customers — what consultant Michael Packer at The MAC Group in Cambridge, Mass., calls "the classic EDI story" — to joint-venture arrangements in which companies from



Corning's Shrednick gauges the way he works with partners according to the nature of the alliance.

the same industry collaborate on R&D or marketing.

Not all of these arrangements exert significant impact on the information systems of the parties involved. But, as Shrednick's experience indicates, they certainly have that ability.

The way Shrednick works with partners varies according to the nature of the alliance and the needs of the parties. In one case, 50% of a Corning division was sold and became a joint-venture company. The new firm's IS functions, which had been handled by Corning's central IS, had to be carved out. In order for the joint-venture company to be able to continue operating, it decided to buy some IS services as well as some application software

from Corning. So the new firm was put back on-line, but the relationship was different — now Shrednick had to monitor the new company's usage in order to tally up billable costs.

Sometimes deciding what resources Shrednick's department should provide to a partner requires careful consideration. For example, in an alliance with a Japanese company, Shrednick was asked to provide a full-time IS business manager to oversee the IS function for the joint-venture company and matrix the resource contributions of the partners.

While Shrednick has had to adjust to a change in the basic charter of his department, other IS executives are finding that

they have to change the methods they use to collect and categorize information when they begin to fuse their systems with allied partners.

Jack Hill, director of system services at Greenwood Mills, Inc., in Greenwood, S.C., made that discovery when he implemented an electronic data interchange (EDI) system to link the textile company with both customers and suppliers. "We used to have the freedom to design systems any way we wanted," Hill says. "Now that we're tying in with people upstream and downstream, we all have to learn to talk a single language."

On a technical level, this meant deciding on a standard EDI format. But that was really only the beginning. A much larger challenge was standardizing the terms that all the companies used to describe the fabric flowing in and out of the company's plants.

For example, Greenwood, which produces undyed fabric and denim, used to keep track of material using standard sizes such as 36 or 48 inches. Those measurements were really only minimum sizes; a 36-in. bolt of material might actually be 37 or 37 1/2 inches wide. While that difference was of negligible concern to Greenwood, it was a bigger issue for the clothing manufacturers that are its customers. Some of them were using numerical-control equipment sophisticated enough to take advantage of small variances in sizes and would have to remeasure Greenwood's fabrics to determine the exact measurement.

As these customers pointed out, the need to perform this kind of adjustment negated some of the value of receiving electronic shipment data from Greenwood. Now, Greenwood conforms to the cutters' requirement and uses exact measurement data.

Fabricator also needed standardization. Greenwood designated names for shades, while cutters used delta, a value that describes the amount of variance from a standard color such as black or red. Recently, Hill

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EXECUTIVE REPORT

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reconfigured his database to record shades as a data value.

Hill says that his vertical partners now are able to pull information directly from the Greenwood database and input it into their own systems with a minimum amount of alteration. In order to make this possible, Hill has had to work closely with the external partners to standardize on terminology. Likewise, a group called the Textile Apparel Linkage Council (TALC) formed to iron out the same kinds of differences in terminology among vertical companies in the textile industry.

Reconciling inconsistencies in data handling is a large step toward elimination of the redundancy in collection and input of data that occurs in a vertical channel, according to Branch Allen, professor of business man-

agement at the Darden Business School at the University of Virginia in Charlottesville.

"When each company looks at itself as an island," Allen says, "they each have to do everything themselves, even if that means that a task gets done dozens of times at different companies."

A more sensible approach, Allen suggests, would be for the IS organizations to merge together so that each process is done only once. "In a functional sense, each IS organization will become a piece of a larger IS organization that is responsible to all the alliance members," he says.

Report performance
Steven R. Hyde, director of dealer systems at Navistar International Transportation Corp. in Chicago, agrees with Allen. "Most of the time when our dealers call in," he says, "they are looking for information to allow them to do what we have

already done."

To order a part, for example, a Navistar dealer telephones a customer service representative, who checks its availability in an inventory database. Once the dealer is able to determine that the part is in inventory, he places a verbal order, which the Navistar representative types into the database.

With the help of AT&T, Hyde is creating a network that will allow dealers to access inventory information and place orders directly in Navistar's mainframe. Each dealer organization will also have a file on the mainframe that contains a record of all its orders.

"When this project is finished,"



Navistar's Hyde says his systems will also be his customers' systems.

ished, our information system will also be our customers' information system," Hyde says. From that point on, he figures, when changes are made to the information system, they will have to be done with the advice, if not the consent, of Navistar's customer base.

By hiring AT&T as a systems integrator, Navistar avoids much of the pain of creating the technology for its new network. Some changes will have to be made, however. For example, AT&T uses a different flavor of UNIX and a different graphical standard than Navistar does, so some applications that were developed over the last six months or so may have to be rewritten or scrapped.

Hyde regards the situation philosophically. "We can no longer be the total master of every aspect of our information systems," he says.

Deeds to share
David R. Browdin, director of Arthur D. Little, Inc.'s North American management and consulting practice in electronics information and telecommunications, sees a definite trend toward information sharing across organizations. Originally, he says, such arrangements were typically dominated by a single industry leader, but now there is a movement toward a more equal sharing of responsibilities. He breaks down the movement into three "waves."

In the first wave, an industry leader allows smaller companies to buy time on an information-sharing network. One example of this is customer reservation systems, which had been dominated by American and United Airlines. Since all travel agents used one or both of these services, smaller airlines had no choice but to tag along. The difficulty with these systems was that the primary company, United or American, could dictate that their flights appear first in the listings. In some areas, travel agents needed to scan five or six screens of United and American flights before getting to listings of other airlines.

In the second wave, groups of companies or trade groups join together to create an information-sharing network or at least to set standards and rules for such a network. TALC is an example of this in the garment industry; organizations that make, organize, sell, and ship clothing, such as Cirrus are an example in banking.

Another way companies may share information is through

neutral third-party networks administered by providers such as systems integrators. One example of this is Electronic Data Systems' purchase of 50% of System One Corp., a supplier of computer reservation system services. Joe Olman, vice-president of EDS' transportation group, says the significance of this partnership is that it marks the first time a nonairline company has provided this service. This allows the sharing of information similar to that in American and United's reservation systems but adds the neutrality of a firm that "wants the best for System One, not for any particular airline," according to Olman.

The next wave, Browdin predicts, will be a progressive broadening in control over shared information systems as IS between companies becomes more interlocked. As an example of this third wave, Browdin cites a defense subcontractor, which he declines to name, whose manufacturing resource planning (MRP) system is tied into a scheduling system at the primary contractor. When the delivery of a weapons system is stretched out, that data is sent directly to the subcontractor's MRP system.

It is when alliances reach this level — when suppliers and cus-

WHEN EACH company looks at itself as an island, they each have to do everything themselves."

BRANDT ALLEN
DARDEN BUSINESS SCHOOL

tomers are joined at the planning and production systems or when two manufacturing companies come together to develop products — that things can get really challenging.

The obstacles at this stage are not so much technical as philosophical and cultural. Resolving systems incompatibilities and installing networks is not an inconsequential task, but usually some workable compromise can be reached. Even when it can't, intermediaries are an option. Brad Group, a senior consultant at Inder Group, Inc., says that allied partners are increasingly using systems integration to use information-sharing networks.

When companies reach the stage of trying to resolve incompatibilities in work style, push really comes to shove. In these situations, it is no longer enough for IS to manage the systems, says Kathryn Rodie Harrington, professor of strategic management at Columbia University. They must become design

High (tech) society

Technology firms are among the leaders in joining forces with other companies — developers, OEMs, value-added resellers (VAR) and even competitors.

With the possible exception of IBM, there are no remaining self-sufficient, vertically integrated high-tech companies, says Charles Varga, president and partner at The Carver Group, Inc., a consulting firm in Freshington, N.J. "Scan the technical manuals behind an IS director's desk," Varga says, "and you are going to see an awful lot of different logos. In order to make the IS director happy, the companies behind those logos will have had to do a fair amount of joint-development work."

For many high-tech companies, alliances are shotgun marriages occurring when customers cannot adequately be serviced by just one company's products. Many of these partnerships are made at arm's length, but others are better described as 10-foot-pole length, as when less-than-friendly firms find it necessary to share information. Therefore, one major challenge for companies is to decide what information privileges to grant to partners.

Cincom Systems, Inc., for example, maintains more than 50 alliances and partnerships, ranging from cooperative marketing agreements to VAR agreements to OEM projects. This means the company must maintain an efficient and controlled information exchange. To do that, Cincom has installed several electronic mail networks, bulletin-board services, a shared database and dozens of test beds during the last five years.

Part of the process included changing the way Cincom stores technical information to make finding answers to questions easier for partners outside the company. Previously, technical information was stored in manuals either electronically or in hard copy. Partners who needed assistance had to call customer support staff who would then look up the answer and read it over the phone. This storage method was inefficient, however, since the same question often would be researched multiple times by Cincom technical representatives. So the company created a problem-resolution database to allow authorized users to dial into Cincom's computer to get answers themselves.

This system required not only creating the database but also setting up networks. Yet these technical details were not the major part of the project, according to Bill Dorcas, Cincom's vice-president of strategic alliances. The main task was deciding who should be allowed to see what and who would be able to talk with whom, he says. Each partner was considered individually — looked at with information it needed based on the type of application it worked on — and was assigned to the appropriate networks.

Cincom is not the only company that keeps its partners plugged in, not the only one facing the question of how much to share with whom.

Novell, Inc. has set up E-mail and bulletin-board services for its developer community using a hierarchical approach to determine user privileges. Each partner who can access Novell's computer is designated a browse, silver or gold rating. Browse partners are developing Novell-compatible software; silver partners are making products that use Novell's IPX/SPX protocols and gold partners are working on client/server applications for Novell products.

Placing partners in such categories, according to Jack Blunt, director of the strategic development group at Novell, makes it easier to determine what information each developer should be allowed to access.

One of the most extensive uses of shared databases is at Microsoft Corp. Microsoft's On-line database contains Microsoft's solutions to problems solved by many of the company's 3,000 developers.

Like Novell's system, Microsoft's On-line is hierarchical. The lowest common denominator is information about retail products. The subset of the database can be accessed by general customers or dealers through GE Information Services' Genie or Compuserve, Inc.'s Compuserve. The next level, which allows users to connect directly to Microsoft's computer, is open to developers creating products that work with OS/2, Windows or other Microsoft systems software. The final level of the hierarchy is for OEMs. This piece of the database includes information on such things as binary adaptation bits.

LAURIE STEVENS

consultants finding new ways of reporting and recording information and new kinds of relationships.

That's a lot simpler to say than to do. The MAC Group's Packer says, "When you talk about joint product-development efforts," he says, "you are getting into an area where it is conceptually almost impossible to have standards. It's not even so

much the question of CAD standards. Where it really gets messy is when you start dealing with how organizations conceptualize the coding of parts."

With the exception of the aerospace and computer industries, Packer says, few companies are even attempting real systems integration for joint projects. "There are a few experiments in the auto industry,"

he says, "but that's all they are, experiments, because they keep getting hung up on data standards." Even companies that are trying to unify internal systems across countries in an effort to achieve globalized operations are struggling with the same issues of limited commonality in data formulation.

There are also complications that the multinationals dealing

with internal consolidation don't have to consider but that firms cobbling together alliances with current or potential competitors do. One is establishing the value of information. Dixon Doll, chairman of DMW Group in Ann Arbor, Mich., says he believes that negotiations about sharing information should start from the highest level in the corporation.

Richard Koeller, vice-pres-

ident of information technology at Whirlpool Corp., which has a joint venture with Philips International BV to sell appliances in Europe, is very specific on this point. "Companies are not used to negotiating the sharing of information," he says. "They find it hard to place a value on it. But as information moves beyond the walls of the organization, its value will have to be considered." ■

Ironing the wrinkles

Even when information sharing takes place within the context of supplier and/or customer relationships, there are issues that must be negotiated and resolved.

David M. Page, manager of the National High Technology region for GE Information Services,

points to a few issues to consider when negotiating the sharing of information:

- **Boundaries of exchange.** It is important to consider whether data flows need to be bi-directional. A supplier posting new product specifications to its dealers may need only a one-way route, while a more equal partnership will require a more complex system through which each party can transmit to the other.

- **Access requirements.** It may be appropriate to establish different levels of access for different partner companies. For example, a firm may have dealers in different categories based on levels of sales.

- **Making allowances for levels of sophistication.** It may happen that an organization with which you are planning to share information will not have an IS department of its own and only rudimentary information systems. In such an instance, it is necessary to consider how to not only provide information but also to store it.

Page points to one supplier whose dealers were receiving electronic mail messages every day. The problem was that without having a means of organizing and storing the information, the messages were being read and then forgotten. The solution was to set up a searchable database on the supplier's mainframe.

LARRY STEVENS

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INTERVIEW

Collaboration without compromise

The University of Michigan's C. K. Prahalad says that U.S. companies could extract more value from alliances with overseas competitors

On the whole, U.S. companies have not fared well when they have entered into business alliances with overseas competitors. According to C. K. Prahalad, professor of corporate strategy and international business at the University of Michigan in Ann Arbor, one major reason for this poor track record is a failure to understand the strategic implications of information-sharing.

Prahalad has spent five years studying strategic alliances around the world and is currently collaborating on a book about such alliances. In a recent conversation with Computerworld Features Editor Joanne Kelleher, he discussed how U.S. companies can improve their gains from collaborative efforts.

When did competitive alliances first become a significant feature in the U.S. business landscape?

U.S. companies really only began engaging in reciprocal relationships during the '80s. There were a lot of joint ventures and licensing arrangements before, but they tended to be purely American companies being tapped by foreign companies — be they European or Japanese.

Why have U.S. companies generally not fared as well in these arrangements as their foreign partners?

I should say at the outset that I am talking about alliances that are primarily oriented toward skill transfer or skill-sharing, rather than economies of scale. In skill-transfer alliances, the primary value in the relationship accrues to the company that can learn faster. It is the speed of learning and the capacity for absorption, internalization and reconfiguration of skills that allow a company to extract value. And, if you look at the relationships between U.S., European and Japanese firms, it is clear that U.S. firms have had enormous difficulty learning from others.

Why is that?

One reason is that it is not part of our culture. The heroes in American firms are those who invent,

not those who extract knowledge from others at low cost.

We also need to realize that longevity may not be the best measure of success in these relationships. Technologies change, market evolution creates new opportunities, and the strategies of the firm change.

Finally, one point that is often forgotten is that many of these relationships involve companies that are also competitors. In the past, U.S. companies have often neglected to consider whether a collaboration is simply a tactic on the part of the potential partner to fulfill a particular competency gap.

Among the companies you have studied, is it often a case of simply filling this competency gap?

In a variety of cases, it is just that. One good example is NEC, which for a long time has had a very clearly articulated and widely advertised strategy for reaching a position of dominance in three sectors — computing, communications and components. The company's stated goal was to shorten its learning time and reduce the cost of acquiring new competencies, and the way it did this from 1965 through 1987 was to get into at least 130 alliances, licensing arrangements and OEM arrangements with European, American and Japanese companies.

Most of the alliance partners did not look at how they fit into NEC's strategy. If they had, it would have been quite obvious that this was the company's tactic for learning. Instead, they ignored what NEC was saying and helped it climb to the No. 1 position in all three of its target areas, with a comparatively very low investment in R&D.

So companies should pay close attention to the motives of potential partners?

And the strategy. As well as the capacity to absorb. From the very beginning of these relationships, companies must be sensitive to the relative learning capacities of the two partners and be prepared to either gain a lot of value or ultimately lose a lot of value.

How can U.S. companies improve their own capacity to learn and absorb?

They can pay more attention to communicating the purposes of such relationships to those at the operating levels and to defining what roles those people will have to play to get the most benefit for the company.

They can also give more training to people at all levels

tional factors doesn't usually come under their purview.

That's not to say information systems people couldn't help to protect those other kinds of information, which are very valuable. They should certainly be a part of developing an overall strategy to educate people at various levels in the company on what the implications are of various kinds of transfer.



How big an issue is inadvertent information leakage?

I think a lot of the so-called leakage is protectable if top management takes the time to establish very clear goals and communicate them clearly up and down the organization.

There is something else, however, that is emerging as a major problem and which companies should be considering. That is the issue of ownership of intellectual property.

about how to protect their technology.

In your experience, how involved are information systems managers in helping to structure the information-sharing within competitive alliances?

There are several different kinds of information that get transferred in an alliance. It goes much beyond just the transaction data and access to the databases of the company. There is technical information about processes, products and designs. There is market information about customers, customer expectations, features, quality levels, prices and volumes. And then there is what I would call the organizational information — information about the culture of the firm and how it operates.

The systems folks are increasingly capable of helping companies structure market-related data, but information relating to product design and product development or organiza-

Some of the firms you studied had actually established internal clearinghouses for the collection and dissemination of information. Is this something that involves an electronic database? Or is it something less formal?

Typically, it's less formal, but I can easily see a role for establishing a detailed database for clearance of information. It also would be valuable to establish databases on all the partners — their histories in terms of alliances and joint ventures, their current alliances, the strategies they appear to be following. That way, anybody who is working could be constantly updated on what else is happening.

How much catching up must U.S. companies do?

I think they are learning very, very fast. There is a lot more sensitivity to what is being traded and greater understanding that information is really what creates the value. ■

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For security's sake, trust — but verify

BY LEILA DAVIS

With unlikely alliances becoming commonplace and competitors turning into part-time partners, privacy and security experts urge companies that are considering such an affiliation to borrow a policy from the world powers. Trust based on verification is a concept that works not only for global politics, they say, but also for business opportunities that require opening computer files to sometime competitors.

"Get as much legal, electronic and physical protection as you can and then

rely on the good faith of the business relationship to make the alliance operate smoothly," says Lee Hagelshaw, a partner in the law firm of Hagelshaw & Cole in San Francisco. "If you don't have some degree of good faith in the other company, you probably don't want to pursue a relationship with them." However, given competitive realities, potential liabilities for breaches of privacy and fiduciary responsibilities to stockholders, faith is just not enough.

Companies must also be prepared to demonstrate that they have exercised due care in the protection of their information

assets through legal measures and internal controls. If a company loses money because competitive information has been improperly exposed, the senior executives could be held responsible, notes Gregory Therakalen, the national director for information security services at Ernst & Young's national office in Cleveland. "Senior management always has a responsibility to its shareholders. If there are poor controls, it could be proven that they did not fulfill that responsibility," he says.

In addition, a company may be liable for the protection of information about its

customers and its own personnel under state privacy laws, Hagelshaw says. "Employees and customers have rights that information about them not be disclosed," he adds.

While alliances are generally formed at the chief executive officer level, and the wording of legal agreements is usually hammered out by lawyers, responsibility for comprehensive data protection falls squarely at the feet of the information systems director.

To protect themselves and their companies, IS directors should take an aggressive stance when faced with a potential alliance, making sure that no sensitive information is revealed, even in initial negotiations, without a nondisclosure or confidentiality agreement in place.

According to Hagelshaw, "That way, if the two companies decide not to pursue the alliance, your data is still protected." If the companies do form a partnership, you will want an agreement anyway to ensure that it runs smoothly.

A before-the-fact analysis of what should be protected is crucial, experts say.

"Request every copyright or patent that can be requested before an alliance," Hagelshaw suggests, "because each of these things will enhance your company's position to protect it. If you haven't done these things, a court could conclude that there was no intention to protect."

GET AS MUCH legal, electronic and physical protection as you can and then rely on the good faith of the business relationship to make the alliance operate smoothly."

LEE HAGELSHAW
HAGELSHAW & COLE

If there is a rule of thumb concerning these negotiations, it says that it is better to err on the side of safety. While most companies are aware, for example, that they must protect a trade secret such as new product plans directly involved in the new alliance, fewer think to erect defenses around valuable tangential information that may be exposed in the course of a joint project.

"If another company is looking at plans for a specific project, they also may have access to all your project planning for the next several years, involving other products, time frames and manufacturing information," says Gerald Isaacson, president of Information Security Service in Northboro, Mass.

Often, companies also overlook the sensitivity of marketing data, Hagelshaw says. "Market research, customer lists, lead lists — these all require protection for competitive reasons," he says.

Another potentially serious mistake is defining "information" too narrowly. Software code that is developed in-house is often at risk, and if it is not part of the product or service directly involved in the alliance, its protection may be overlooked. Since many firms develop proprietary software as the competitive edge in

Continued on page 86

Davis is a free-lance writer based in Alexandria, Va.

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Trust

CONTINUED FROM PAGE 82

their business, exposing that software to a competitor or even losing it to the public domain can have a serious impact.

"It is so easy to modify software so that it looks different but does the same thing," Hagelshaw says. "The company involved should carefully document the dates on which software was sent to outside parties, so that later, if Company B had never touched that type of software before a certain date and suddenly developed their own, it could be proven that the idea came from Company A. Record as much as you can in writing."

All such exclusions should be thought

through carefully and in advance, Isaacson says, because a single carelessly generous gesture can translate into forfeiture of rights. For example, he says, "If you let someone else use your [internally developed] software to perform a certain function, you could be putting that software in the public domain if you have no restrictive clauses to protect it."

Another area of vulnerability that is easy to overlook until a problem arises is the use of shared data networks, such as travel reservation systems. "If you are on a network like this, you should think through how it works and put limits on how it can be used. Insist on control of who has access to your data. If there is nothing in the contract about this, create a separate agreement to stop unauthor-

IF A COMPANY does not have a comprehensive security plan in place, "data classification will be forced on the company through an alliance, and MIS will have to map the data against what the deal calls for."

GREGORY THERKALSEN
ERNST & YOUNG

ized access to your files on the network," Hagelshaw warns.

Isaacson, who has experienced some of the kooky details of information protection in alliances when he has bid on projects with other firms, recommends an aggressive stance. "Give out new passwords, new access procedures under

the alliance, so you can have an audit trail on all new people using your files. Establish what sanctions you can apply if there is misuse; get the penalties down on paper," he urges.

Identifying potential problems and constructing barriers to the outside will not do much good if a company does not have good internal controls in place, however. For one thing, a breach of the legal agreement may be difficult to enforce, since the other firm can claim that the data was not regarded as sensitive by the firm to which it belonged.

Furthermore, as Therkelsen points out, if a company does not have a comprehensive security plan in place, "data classification will be forced on the company through an alliance, and MIS will have to map the data against what the deal calls for."

In that kind of a situation, it can be difficult to ask partners to adhere to your level of security, which is what Isaacson says he does when joining forces with another company. He also reserves the right to verify compliance through audits. "If you don't have internal controls, the external ones won't work and are less defensible legally," he says.

To avoid that quandary, security professionals say, IS departments without a data protection scheme in place should try to implement one before the need arises. Chances are that it eventually will, Isaacson notes. "There are very few companies that won't be taking advantage of some kind of business alliance in the 1990s," he says.

Early warning

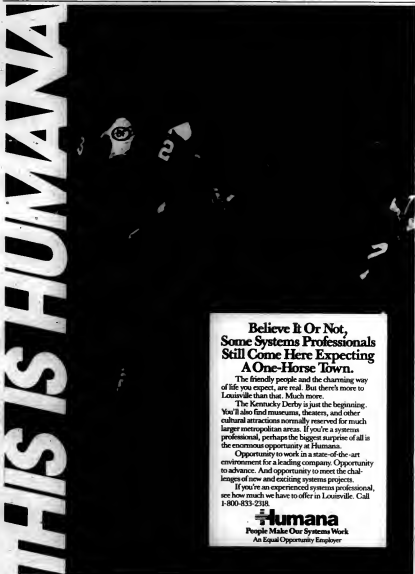
Next to internal preparedness, the biggest plus in constructing a viable defense for vital information is early IS involvement, Therkelsen says. The typical scenario is for IS to be called in after alliance plans have progressed beyond the formation stage.

However, he says, when IS gets into the process late, it must scramble to understand the agreement before it can figure out what controls need to be put in place. "And if they don't do so, it leaves MIS to be the scapegoat later on if anything goes wrong," he adds.

Since one of the most frequently cited reasons for exclusion of IS from the initial planning stages is the need for secrecy, Hagelshaw says, an IS director who is drawn into the process will probably be asked to perform most of the work single-handedly and discreetly.

"Often, a company will want to keep negotiations of a joint venture or other alliance confidential until the final agreement is reached, so the IS director may not be able to use others on his staff to work on the process," he says.

One ally that an IS manager can and should enlist, however, is the business manager with direct ownership over the data. "MIS can't do this alone," Therkelsen says. "You have to go to whoever owns the data and say, 'Tell me what you think we can't afford to release.'"



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How solid is your site?

Here's how to bulletproof your infrastructure and slash downtime

BY KENNETH G. BRILL

Information outage is the corporate equivalent of a heart attack.

Yet, today, there is a huge — and growing — gap between the uptime expectations of information users and the reliability of the facilities required to support computer operations. Ten years ago, site malfunctions accounted for just 3% of downtime. Unless the reliability of facilities and their environmental infrastructure improves dramatically, that figure will rise between 20% and 30% of total processing downtime by 1995.

In contrast to the dramatic improvements in computer hardware and systems software, the design and operation of the physical site and its environmental infrastructure has not fundamentally changed in the last 15 years.

There has been so new technology to revolutionize site reliability. If anything, the site and its infrastructure have become increasingly complex, interdependent and less reliable. Furthermore, almost nothing has been done by any of the computer manufacturers, vendors, architects or engineers to ensure that the facility's infrastructure does not become the new weak link in the reliability chain.

Because site reliability has not improved at the same rate as other causes of information outages, the unglamorous work of improving the physical infrastructure is rapidly becoming critical to achieving corporate competitive advantage and survival, especially in large, multiplatform organizations.

Brill is president of Computergate Engineering, a Danvers, Mass., consultancy specializing in disaster avoidance and site reliability. He is founder of the Uptime Users Group.

However, the solution to these problems is not new technology or more money, although both may help. Rather, the solution is developing a vision of what is wrong and changing organizational priorities to achieve increased site reliability.

To do so, information systems managers need a conceptual framework for the strategic management, organizational and engineering actions that must be taken to reverse current trends. The role of top management is especially crucial in changing organizational priorities.

The price of downtime

While site malfunctions are rare, they have a more profound impact than any other type of failure because they have an immediate global effect. In contrast, a CPU or direct-access storage device malfunction affects only a portion of total IS resources, and recovery can be concentrated on a limited problem.

A single cycle of site malfunctions can easily

put total end-user uptime goals out of reach for an entire quarter or even a whole year in especially serious cases. Also, whenever steady-state operating conditions are abruptly disturbed, components are stressed and will randomly fail for months afterward, creating additional unpredictable downtime.

Companies with a heavy computer dependence are increasingly going to need their physical facility to operate continuously without shutting down for maintenance or malfunction.

Unfortunately, achieving this goal requires a generational leap in reliability for which the design, construction and facility management process is not prepared.

Most architects, engineers and contractors have been conditioned by years of competitive experience to build things that "work" instead of things that never fail.

To these professionals, "working" can mean any of the following:

- What can be done within the budget.
- What the construction schedule will allow.
- What has worked well enough in the past to make the level of user complaints tolerable.
- What has already been designed once and can be easily duplicated.
- What the tradition has been.
- What is easy or fastest to do, least costly or most profitable.

While there are always individual exceptions, this is the current level of construction sophistication. To further complicate matters, many companies are penny-wise and pound-foolish when it comes to planning and budgeting for reliability.

In comparison to investments in computer hardware, which can cost between \$2,500 and \$3,000 per square foot, the facility's environmental infrastructure (excluding the building shell) is small.

An unfortunate result is that project cost figures are often established and have



- Site-related crashes are climbing
- IS must team up with facilities people
- The solution: Service and reliability contracts

The Shedd

become cast in concrete before reliability requirements are established.

Organizations building new data centers that ignore these revolutionary changes in expectations will run a major risk that the multimillion-dollar investment will be technologically obsolete long before it is fully depreciated. The result will be having to live with an inadequate facility or reporting a major financial loss by writing it off.

IS/real estate clash

Although it is usually denied, the information systems and facility/real estate functions have divergent goals, leading almost inevitably to conflict and dysfunctional results. Almost without exception, the IS and facility/real estate groups march to different drummers and are measured by different standards. In this case, you cannot expect the group that is accountable for uptime to be dependent on a second group that is not measured by the same standard.

It is precisely this clash of objectives between IS and real estate functions that is at the root of facility disasters in many data centers.

Typically, the IS operation is housed in an office building complex under the jurisdiction of the real estate or facilities

Maximizing facility uptime

Problems

- Physical infrastructures are the weak link in systems reliability.
- IS and real estate have different interests.
- Builders and designers have a "good enough" mentality.

Solutions

- Survey and assess site reliability.
- Contract with facilities managers for acceptable service levels.
- Carefully define reliability goals.

group, which reports to senior management through a different chain of command.

In a large organization, millions of square feet of building space located worldwide can be included in their responsibility. By comparison, space devoted to computer operations is minuscule, yet it generates a relatively astronomical number of problems.

In contrast with IS uptime and availability criteria, which can be measured daily, the real estate function is measured on a much longer time horizon, which includes such unquantifiable factors as appearance, cost control and ability to meet schedules.

If the trash can in the president's office does not get emptied, the facilities function hears about it within minutes. On the other hand, no one ever knows or appreciates all the things this function does to avoid problems and keep a wide array of competing interests happy or at least content enough to maintain job security.

Discounted cash-flow techniques often dictate building design and management decisions. What is missing from this commercial real estate profit-making financial equation is the cost of information outage. For example, in one firm, it took three weeks to negotiate a 45-minute, planned downtime window for absolutely crucial preventive maintenance to electri-

cal switch gear. At the final meeting to discuss the outage, 45 people were present, representing users from all over the world.

These real costs of planning for an outage, plus the cost of the outage itself, must be factored into the discounted cash-flow equation. While it is an extreme case today, in five years, as networks become even more tightly linked and global in scope, downtime of any type is going to become even more expensive and ultimately impossible to arrange.

Service-level agreements

Against this backdrop, the solution is for IS and real estate groups to negotiate a facility service-level agreement covering performance expectations.

Historically, these agreements have been used between the IS group and its customers in the company. Today, this concept needs to be switched around and applied to the function on which IS depends totally. If the IS goal is 99.5% uptime, the facility goal must be at least an order of magnitude higher, or 99.95%.

Besides spelling out the level of uninterrupted uptime required, the agreement should clarify a number of other issues, including the following:

- Quarterly, semiannual or annual

Looking for trouble? Better hope you find it

BY JOSEPH MAGLITTA

When it comes to computer uptime, it pays to look for trouble.

One day, about a year ago, a staff member at Burlington Northern Railroad Co.'s central data center in St. Paul, Minn., noticed a noisy electrical circuit breaker. He mentioned the humming part to Bob Brydges, the railroad's assistant vice-president of computer operations and support services, who then investigated it.

As it turned out, Brydges recalls, there wasn't a backup circuit breaker available in the building. Or in the entire Twin Cities area. Worried about a short circuit, Brydges had IS staffers quickly locate, test and certify a replacement part to avert a possible crippling power outage.

Help in the hour

Anxious to nip bigger disasters in the bud, Brydges and his staff decided to take the offensive. "We went looking for problems," he says. The company formed a special ongoing task force designed to sniff out facility problems that could destroy computer operations.

"What?" you say. "Worry about a building's wiring, plumbing, electricity and cooling problems when you've got networks to run, systems to install and users to please?"

You bet, according to a growing number of information systems organizations that fear their buildings and physical infrastructures are fast becoming the weakest link in the systems reliability chain.

Crashes caused by infrastructures are hard to count, but some consultants

and users worry that the problem is worsening. The reasons: aging buildings, increasingly unreliable electrical power and heavy, round-the-clock computer and network use that would have been unimaginable a few years ago.

To combat millions of dollars in possible losses and lost productivity, more IS chiefs are taking a closer look at the infrastructure problem. Their aim is to detect and fix any support system problems that could disrupt a system's uptime and daily operations.

Some consider planning for infrastructure threats a preventive measure. At First Commerce Corp., a New Orleans-based bank chain, for example, IS officials are treating the issue as part of their \$100,000-a-year disaster preven-

tion planning and recovery effort.

The motivation is simple: "We just don't want to go down," explains Jim Grenier, senior vice-president of the bank's information systems division. Earlier this month, First Commerce finished a four-day on-site audit designed to pinpoint any potential trouble spots in its 4-year-old headquarters.

For others, the problem is all too real: American Airlines and Banker's Trust Co. are among big firms that have suffered crippling infrastructure-related crashes during the last year. These and other widely publicized crashes have prompted such big names as American Express Co. and other firms to invest heavily in ways to ensure site uptime, or at least to begin exploring it.

The most visible sign of growing interest in the Uninterrupted Uptime Users Group, a new organization formed for IS and facilities managers interested in preventing systems failure before it occurs. Representatives from some 24 major organizations gathered in New York in February to hear Alan Freedman, vice-president of technology and strategic planning for Banker's Trust Co., discuss methods of handling the problem.

Even the cautious are at risk. A few months after the "bummer" circuit breaker was spotted at Burlington Northern, a short circuit caused a two-hour system shutdown last November that decreased railroad traffic across

thousands of miles of track.

At the time, the railroad's IS management was already in the process of probing the deeply troubling problem, Brydges says. If a tiny circuit breaker could disrupt computer operations, he wonders, what other facilities-related accidents were waiting to happen?

On the trail

The company formed a special team to sniff out infrastructure problems. IS personnel worked alongside with building engineers, facilities people and equipment vendors, taking a fine-tooth comb over the circa-1910 building that housed the 500-person IS staff. "We looked at electrical and communications closets searching for a single point of failure," Brydges says.

So far, the team has found several potential service disrupters, according to Brydges. But more importantly, the whole process has made the infrastructure audit part of the IS routine. Now, the team meets at least once a month to seek out and fix potential infrastructure problems.

Brydges, Grenier and others are convinced that the money and time are well spent. At First Commerce, an audit showed that the infrastructure was in good shape. Consultants advised regular testing of uninterruptible power supply batteries and more regular maintenance but nothing serious.

However, both men worry that their colleagues are not as attuned to infrastructure reliability as they should be. "People that don't pay attention are in big trouble," Brydges says. "Big problems," Brydges says. Grenier agrees that many need to look at the issue, but few actually do. "The worst thing is that a lot of people don't think they need it," Grenier says. ■



First Commerce's Grenier: "We just don't want to go down"

Maglitta is a Computerworld senior editor, in depth/integration section.

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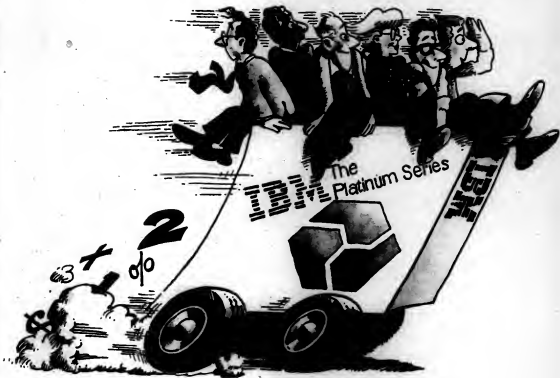
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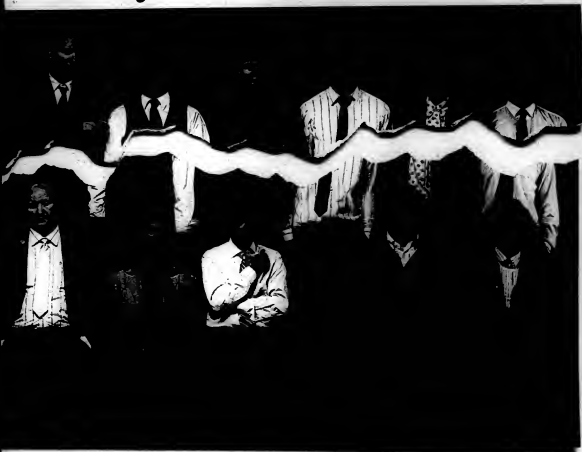
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scheduled downtime for preventive maintenance.

- Planning and notification procedures.
- Management methods for ensuring minimal downtime.
- Risk exclusions.

The first step in relaxing the natural tensions of implementing a facility service-level agreement is to take six months or a year to collect data, experiment with wording and fine-tune risk exclusions. Actual measurements should be published only after an extensive trial run.

Given the potential for conflict and delay, top management may wish to use some outside consulting to guide the process. Wise facility managers will recognize that they cannot prudently sign an agreement guaranteeing a certain level of uptime without first having studied and adopted a set of site reliability criteria. They must also have used these criteria to identify and exclude deficiencies and vulnerabilities from the agreement.

Based on these exclusions, joint decisions can be made on whether problems must be corrected or whether it is more cost-effective to live with the downtime risk via self-insurance. Only by having a common road map and destination can the current generic, often hostile, authority/accountability conflicts between IS and facilities/real estate be resolved.

Reliability standards

Just as a facility service-level agreement can clarify the relationship between information systems and facilities/real estate, so, too, can reliability criteria explicitly state the level of uptime performance ex-

pected from a new facility.

These additional criteria supplement the traditional data center design goals of gross and net square footage, first cost per square foot, watts per square foot, cooling tons per square foot, weight per square foot, equipment adjacencies, stacking plans and so on.

Unless specific reliability criteria are included to guide the design process before establishing a budget, key decisions will be made without adequate consideration of the long-term consequences. This inevitably leaves the end user to suffer risks and costs that could have been avoided.

The following broad reliability categories have been derived from analyzing the root causes of malfunctions in building

systems and equipment:

- Uninterrupted computer and communications operation.
- Compartmentalization.
- Damage control and loss minimization.
- Physical plant operation.
- Maintainability.
- Flexibility.
- Physical security.
- Protection from man-made and natural hazards.
- Systems and site integration and testing.
- Identified and acceptable failure modes.

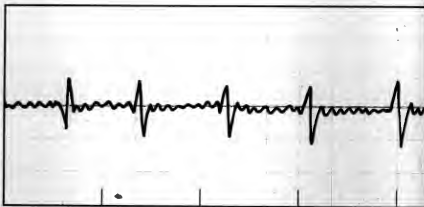
Each of these broad categories has additional subsets that must be customized to fit the circumstances of each project. For example, American Express Co. has required two full layers of redundancy

so that even during maintenance or malfunction, one full layer remains.

In the sizing analysis, companies will have different standards for how much spare capacity to allow for growth or degradation of the subsystems over their useful life.

In addition to the customized subsets, there are standards providing detail on engineering principles, practices and don'ts. To begin the process, management must define uninterrupted uptime goals for the facility. Is the operation to be nonstop, without any downtime for repairs, maintenance, expansion or modification? What level of redundancy will be required?

To provide maximum value, the person conducting the reliability analysis



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Good news, bad news

Current concerns about global warming, caused by the destruction of the ozone layer, are forcing a change in the gases used in cooling and halon fire protection systems. This, in turn, will result in extensive downtime — both planned and unplanned.

The new refrigerants are 20% less efficient, requiring more capacity to do the same job. These new gases also have different thermal and lubricating characteristics, which can result in numerous mechanical breakdowns as an entire industry learns to convert from a well-proven technology to an unknown one.

On the electrical power side, the cancellation of nuclear power-generating capacity construction after the Three Mile Island disaster is beginning to show up in energy shortages and brownouts. This is good news for makers of uninterruptible power supplies (UPS). But as energy users have discovered from painful experience, UPSs may not always be reliable. While they may work when the power fails, they can also fail while utility power is trending.

As a result of these trends, previously acceptable levels of site performance are becoming increasingly inadequate.

KENNETH G. BRILL

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must have the following:

- Extensive knowledge of the design, installation, maintenance and troubleshooting of each of the major components of each site subsystem.
 - In-depth knowledge of industry trends and the capabilities of individual products and vendors.
 - Ability to work directly from source documents and to articulate reliability concerns and consequences to IS management.
- They must be fully capable of defending their analysis against the best that other engineers, construction managers, contractors and vendors can generate.
- In the absence of explicit reliability criteria, users, project managers, architects, engineers, vendors, contractors and bud-

get managers will all be using their own values for what "works."

On-line access to automated systems and information is a strategic corporate resource. Organizational dependence on information uptime is advancing so rapidly that the time is not far off when corporate productivity will plummet without virtually perfect levels of information uptime. The site and its environmental infrastructure are rapidly becoming the weakest reliability link in the chain required to access this critical corporate asset.

Considering the investments already made in computer hardware, software and network redundancy, improving site reliability can be very cost-effective compared with other alternatives, such as ad-

ditional CPUs or multiple sites.

By forming a strategic alliance using a facility service-level agreement, both IS and facilities people can get more of what each wants.

Ten years ago, IS faced a similar problem in negotiating service-level agreements with its customers. Today, every large firm has such agreements, and most have realized such significant benefits that managers on either side of the agreement could not imagine conducting business without them.

If the facilities/real estate people are unwilling or unable to participate in an agreement or develop reliability criteria, then IS has little choice but to take an aggressive role in protecting its self-interest. ■

What are the obstacles?

A handful of nearly universal problems work constantly against site reliability. These are part of an industrywide, deeply seated cultural mind-set evident in site after site across the country. Problems experienced at sites include the following:

- **Lack of facility service-level agreements.** Virtually every information systems organization in the U.S. is measured by uptime and has, therefore, negotiated service-level agreements with its end users.

Fewer than one in 100, however, have a corresponding facility service-level agreement that specifies quality levels and uptime for their power, cooling and other critical environmental support equipment needed to run their hardware.

So, on one hand, IS managers are committed to delivering an information product to users. On the other hand, however, they have virtually no control over one of the most critical means of reliably producing the expected result.

- **Lack of IS involvement in facilities management.** IS management traditionally has left facilities issues to engineering experts. IS, however, can no longer afford to be uninvolved in something so critical to its strategy and mission.

- **No plan for avoiding premature facility obsolescence.** Many organizations now building new data centers will find that their multimillion-dollar infrastructure investments will be technologically obsolete long before being fully depreciated. Their choice will be to take major write-offs in order to build new facilities or accept years of living with the consequences of poor reliability design choices.

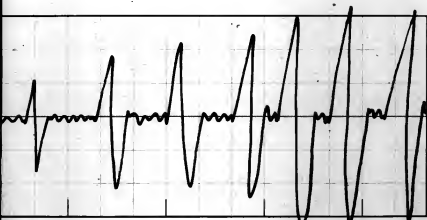
Ironically, these problems are predictable and solvable before the first shovel of dirt is turned.

- **No coordination between designers and builders.** Architects, engineers, contractors, equipment vendors, service technicians, mechanics, facility people and others have been conditioned by years of competitive experience to spend the least amount of money possible to build systems that "work."

Unfortunately, each has a different definition of how reliable something must be in order to qualify as working, which results in conflict, waste and living with disastrous risks. The sad fact is that there is usually no feasible alternative.

- **No IS control over facility management.** Most data centers are tenants in commercial office buildings, which are managed by disinterested cost-flow techniques. Many of these facilities accept the doctrine associated with a "fix-it-when-it-breaks" approach.

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COMPUTER INDUSTRY

NATIONAL BRIEFS

Master of Maxiscribe

Maxtor Corp. last week named Vice-President of Corporate Development Taron Kamdar president of the subsidiary formed to acquire the assets of disk drive maker Miniscribe Corp., which Maxtor bought out of Chapter 11 early this month. Kamdar, 44, was active in the negotiations to buy Miniscribe and has been heading up its operations on an interim basis.

Digital has (more of) it now

Trading on the New York Stock Exchange was temporarily suspended, and takeover rumors reared their heads for the second time in the past several months—but not, Digital Equipment Corp. said early last week, DEC is engaging in a stock buyback merely to buoy the sagging shares. "We believe the current market value of Digital stock does not reflect the underlying strengths of the company," said finance Vice-President James Osterhoff, citing DEC's products, customers and healthy financial position. Now DEC, which has already taken stock in itself to the tune of \$2.1 billion over the past several years, is authorized to buy up to five million additional shares—about 4.1% of total shares.

That's the way you do it

With their respective presidents hailing the deal as the kind of voluntary cooperation that will keep the U.S. chip industry a player in the global market, Cypress Semiconductor and CHOS supplier Altera Corp. last week inked an agreement under which Altera will invest \$7.4 million in an underutilized Cypress fabrication facility in Round Rock, Texas, in return for a minority equity position and the option to acquire up to 20% of the subsidiary that owns the plant. The deal also gives each company priority access to the other's next-generation technology.

Much more than mail order

Compuadd branches out—and strikes it rich—with retail superstore chain

BY RICHARD PASTORE
CIW STAFF

Compuadd Corp. President Bill Hayden was sick of seeing 70% of potential personal computer sales slip through his fingers. As a mail-order catalog PC vendor, he was shut out of the retail-store market—which researchers estimate handles about 66% of U.S. PC unit sales.

Hayden was also growing antsy as the increasingly pervasive, clone-peddling electronics "superstores" holed in on his cut-rate mail-order prices.

So three years ago he decided to launch his own chain of retail superstores to sell company-made IBM PC clones and third-party software and peripherals. Hayden has since watched his sales quadruple to \$400 million.

The firm now has 88 stores nationwide, which bring in 80% of its overall sales. It plans 60 more storefronts for this year and projects total 1990 sales of \$612 million.

Compuadd's distribution fence-straddling seems to fit in the face of accepted business practice—to find a successful niche and stick with it. Also, the timing of the firm's retail foray seems suicidal: It has been well-noted by analysts that the dealer channel is overcrowded, and even the largest players such as Businessland, Inc. have suffered losses.

Hayden admitted that the stores suck up more dollars than the mail order side. It costs Compuadd \$350,000 to \$400,000 simply to put up a store. New hires to staff the stores fleshed out Compuadd's employee roster by 760 in 1989 alone, bringing total staff up to 1,300.

Unsuspected costs have also surfaced. For instance, Hayden discov-

ered he had to expand his Austin, Texas, distribution center by 125,000 square feet to properly service the stores.

"Retailing is a lot more challenging because of the distribution and training," Hayden said.

However, the payback seems to be substantial. The stores generally break even in just three to four months, according to Hayden. Despite the heavy capitalization, the privately held company (which does not disclose profits) "has never had an unprofitable quarter," he added.

The secret of the stores' success seems to be price and customer convenience. The store merchandise is priced the same as the mail-order merchandise—in the bottom 25% of the PC price range (see chart). The stores themselves are set up as true superstores, with well-organized and clearly marked merchandise to appeal to the informed, second-time buyer.

Compuadd was wise to choose the superstore motif, according to analysts. Driven by the price-sensitive upgrade buyer, such computer supermarkets will be the fastest-growing segment among computer stores next year, according to Storeboard, Inc., a Dallas-based research firm that monitors the computer retail channel.

"It would have been a mistake to compete with Businessland on a value-added basis," Storeboard President JoeAnn Stahel said. "Compuadd is serving the commodity market, not the large corporations."

Indeed, half of Compuadd's custom-

We can get it for you retail

center by 125,000 square feet to properly service the stores.



List prices* of similarly configured machines as sold through Compuadd Superstores and Compuadd's authorized dealer channel.

Systems
286 (12 MHz)
386SX (16 MHz)
386 (25 MHz)

*Based on prices as of 1/15/90.

†Includes software but does not include printer.

Source: Compuadd and Compuadd.

CIW Chart Shows Data

ers are end users, and only 20% are Fortune 500. Regardless of class, however, most customers prefer to shop a local, flesh-and-blood dealer.

"Why would anybody else through the mail if they could get it at the same price in the local store?" Stahel asked.

Why indeed? Many Compuadd mail-order customers have actually switched their business to the local Compuadd superstore, regional sales manager Karl Kahler said.

"Most people in town would rather go through a retailer and deal face to face," Kahler said. "It's taken some of the luster off mail order."

"It's cannibalistic to an extent," Hayden admitted. "But the whole operation benefits because when a customer switches to a store, he

Continued on page 59

After Earth Day, HP continues site cleanup

BY J. A. SAVAGE
CIW STAFF

Many corporations wrapped themselves in a green flag for Earth Day on April 22, but most went back to business as usual on the 23rd. At Hewlett-Packard Co., however, business as usual for the last nine years has included cleaning up two toxic spills that have landed the company on the federal Superfund list of the nation's worst-polluted sites.

HP is the only computer company of 21 in California's Silicon Valley harboring a Superfund cleanup site (there are four Valley semiconductor companies on the list). Once-depleting chloroacarbon (CFC) tank it among the top 20 emitters of toxins.

"I think they're serious about [site

cleanup]," said Lawrence Kolb, assistant executive officer of the San Francisco Bay Regional Water Quality Control Board.

Of the two plants that landed HP on the Superfund list, one has been removed. While not an active site, it still requires cleanup. At both sites, groundwater was contaminated.

"In the '70s, [regulators] wanted you to bury [solvent and fuel] tanks so nobody would run over them with a forklift and rupture the tanks," said John Young, chief executive officer of HP. "What they didn't know is that tanks leak—and you can't tell."

Since the leaking, Young said, HP has

begun a program to "elevate every single tank in the company."

In that time, HP has drilled dozens of wells to monitor contamination. The company said that at the source, the concentration of the worst solvent, trichloroethylene, is as high as 25,000 parts per million (ppm). At the edge of the contaminated groundwater plume, which HP said is one-half mile away, the count is 500 ppm. The acceptable level for drinking water is 5 parts per billion.

The \$11 billion company said it will spend about \$100 million to reduce (with plans to eliminate) CFCs, clean up its Superfund sites, put all of its tanks above ground and institute water conservation.



WE MAKE IT HAPPEN

Akkord denounces Apple's raid, legal actions

BY CHRIS BROWN
and SHIRLEY YEH
ING NEWS SERVICE

TAIPEI, Taiwan — Now-defunct Akkord Technology has come out swinging in the wake of Apple Computer, Inc.'s late-March raid on Akkord's premises.

Akkord, which was bought out by Taiwan-based DTC Technology late last year, released a statement denouncing "Apple's arrogant attitude" in its legal maneuvers. Akkord also called the Apple moves illegal and questioned whether Apple may have made a mistake or misunderstood the situation prior to the raids.

With the assistance of Taipei police, Apple initiated raids on a firm called Five Computer Corp. that was occupied by people doing business under the Akkord name, according to Apple, which has since filed criminal charges against five people.

Apple maintains that the raids were necessary to protect intellectual property rights.

Akkord staff members have decried the raids as harassment. "Apple has been kicking people around too much for too long, but this time they really kicked into a steel plate," said Lloyd Chen, one of the named defendants in the Apple suit. Chen said that Apple had no right to carry out

the raids since the technology that the Akkord staff was working on was all based on Motorola, Inc.'s 68000 microprocessor and did not involve copying of software, as Apple alleged.

Akkord was formed last year to develop 68000-based hardware that would come without software. To operate the so-called "Jonathan" machine, the user would need to acquire software literally from the ground up, starting with the system software — particularly the BIOS.

Apple has stiff copyright protection on all software contained in its Macintosh read-only memory (ROM), as well as the BIOS. Apple does not sell the Mac ROM

over the counter, which means Jonathan users would need to have some back-door channel to get their hands on Mac ROM.

Chen, who was the research and development manager at Akkord, noted that the machine did not have to be used as a Macintosh clone. It could also be used for many other purposes, depending on system software used.

Akkord said that Apple has already asked the U.S. government to include the case in the list of complaints it will present to the Taiwanese government in upcoming trade talks.

"I am confident in the due process of our judicial system to bring justice to this case. For all the harassments and anguish we had to suffer, Apple has to pay for it," Chen said.



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INTERNATIONAL BRIEFS

With the aid of a rival?

Last month, it was Matsushita Electric Industrial Co. announcing intent to buy more microchips abroad — 20% of its total complement by mid-1991, according to the Japan-based company. Now, not to be outdone by its archrival in attempts to ease U.S.-Japan trade friction, Sony Corp. has made a similar pledge. By July 1991, it will have upped its current 14% foreign chip usage to 20%, a Sony spokesman said.

Open a new window

Taiwan's growing software industry is the targeted beneficiary of a cooperative effort between the Taiwanese Institute for Information Industry and Microsoft Corp. The two are teaming up to develop a Chinese version of Microsoft's Windows 3.0, with a beta-test release slated for February 1991.

Capital venture

Meanwhile, in Taipei, microcomputer maker Acer, Inc. is planning a two-pronged assault on its depressed earnings — a result of market downturn coupled with hefty 1989 investments, according to the company. Over the next year, Acer announced, it will redesign and relaunch its flagship line of PC products and also roll out its first entries in the burgeoning laptop market, with a notebook-size offering ready by early 1991.

Sun also rises in New Zealand

Datacraft, a \$75 million network systems vendor based in Auckland, is banking in a partnership agreement with Sun Microsystems, Inc. The joint venture gives Datacraft \$75,000 and assorted technical assistance from Sun, which gets development resources for a planned network management software offering to run on Sun workstations, as well as access to its New Zealand partner's 18-dealer worldwide distribution channel.

Optimism tempered by realism

Though industry logs healthy quarter, analysts don't see a comeback yet

BY NELL MARGOLIS
CHICAGO

The computer industry continued to prove an object lesson in perspective last week as the second round of spring quarter earnings appeared healthier than pessimists had feared and wealthier than optimists had hoped.

"If you look across the board," said Dale Kutnick, president of Westport, Conn.-based Meta Group, Inc., "it's hard to find huge growth spurts. Revenue growth wasn't all that strong. On the other hand, we've seen cost-cutting having some positive effect on earnings."

Kutnick and others continued to warn against reading a massive "computer industry comeback" into figures that shine mainly in contrast to last year's comparable quarter, a hot contender for the Computer Industry Hall of Shame.

The ups and downs of this quarter, analysts noted, marked company-specific events more than industry-wide patterns.

Niches, analysts agreed, were still the place to be. For instance, the fertile fault-tolerant on-line transaction processing market — which earlier this month surprised market leader Tandem Computers, Inc. with a better-than-expected first quarter — followed up last week with a 14% revenue increase for second-place player Stratus Computer, Inc., whose profits fell by an equal number of points.

Phoenix Technologies, Inc. logged a 12% revenue gain but is still scripting its net earnings in red — this quarter, a \$4.6 million net loss. President Ronald Fisher's statement that the company's cash-positive position and slimmed-down expense structure bode well for the long term was undercut by the hostile takeover attempt currently aimed at the struggling software vendor.

Storage Technology Corporation erected another marker on its comeback trail with a hefty 513% profit surge to \$9.2 million on revenue up 21% to \$259.9 million. Gains in this league are unlikely to become the norm, said Moody's Investor Service analyst Wolfgang Drake. However, he added, a virtually unrivaled line of tape products should continue to deliver upbeat quarterly results to Storage Tek and could even wait the firm's fortunes through the promised 1992 debut of the "Iceberg" fault-tolerant disk array system now in development.

Control Data Corp. enjoyed a 94% profit rise but saw revenue drop by 50% as it shed several operating units, such as its Imperial disk drive subsidiary, which boosted acquirer Seagate Technology, Inc.'s revenue up

And the best goes on

Computer company numbers continue to shine, but largely in comparison with a dim 1989

Company	1989	%	1988	Q4/89
Corporate Software	\$47.7	53%	\$31.2	9%
Mitac Computer Systems	\$32.2	57%	\$20.5	300%
QMS	\$60.1	33.2%	\$34.6	112%
Silicon Graphics	\$110	61%	\$67.7	102%
Synaptics	\$26.1	105%	\$12.7	114%

Figures exclude first quarter 1990 extraordinary credit

Percentages indicate a reduction in loss

CVI Chart: Danny Hulse

90% to \$676.1 million.

What was, and is likely to continue to be the trend, Kutnick said, is a mainstream sector awash in shrinking margins as firms struggle through transitions to a Unix world that "isn't

happening fast enough for these guys"; a slowing but still growing microcomputer market; and "a mirage that's a disaster where the only real question is: How fast can you cut your costs?"

Compuadd

FROM PAGE 95

usually becomes a much more loyal customer."

Compuadd mail-order customers contacted by *Computerworld* said they would rather switch than fight. "If they opened a store in my area, we'd probably buy from there because it would be much more convenient," said John Quass, data processing manager at Rockwell

Graphics Systems of Rockwell International Corp. in Cedar Rapids, Iowa.

"Their phone service and technical support have been very good, but the service at the store might be even better," added Quass, who has purchased about 40 Compuadd systems for Rockwell Graphics, which has standardized on the vendor.

Despite the apparent customer preference for retail, Compuadd is not abandoning the mail-order alternative. After

playing poor cousin to retail last year, mail-order will get a capital infusion designed to achieve a 50-50 sales balance with retail, Hayden said.

He added that his 50-50 goal is based on "a gut feeling" to ensure the company's long-term survival. "If mail-order gets too competitive, we'll have to retreat side to support us. And vice versa."

"Compuadd is positioned to be very flexible; it could shift either way," Stabel noted.

British firm washes hands of erring daughter company

BY RALPH BANCROFT
BOSTON

LONDON — Atlantic Computers PLC, the world's third-largest computer leasing company, was put into administrative receivership Tuesday by parent company British & Commonwealth PLC after a study discovered that irregularities in accounting practices had led to an overstatement of profits.

B&C, a diversified financial services group, acquired Atlantic — which has 160 subsidiaries in Europe and the U.S. — in June 1988.

The cause of the company's financial problems was a controversial lease called a *Pleasance*. This was promoted by Atlantic as containing "flexpoints" in the life of the contract, when a client could upgrade its equipment without paying penalties.

Pleasance involved two separate contracts. One was between the customer and a bank or finance house that owned the computer and collected the revenues; this contract would typically last six years. A second contract, between Atlantic and the customer and typically four years in length, would contain the flexpoints. Under this contract, Atlantic would take back the equipment and pay off the remainder of the contract to the

bank or other lender.

The controversial element was that the customer could only take advantage of the flexpoints if it replaced the computer with one of the same or greater value. Companies that wanted to swap downfound found themselves locked in.

Lessing companies make their profits from reselling the computer when the lease ends. Atlantic estimated the so-called

residual value at the start of the contract and took the figures into its accounts when the contract was signed, rather than when the profit was actually realized.

B&C said it outlawed this practice when it took Atlantic over but added that the accounts for the 1989 financial year will include a mix of the old and new accounting practices.

According to B&C Chief Executive Officer John Gunn, three separate independent reports commissioned by the bank indicated that Atlantic would perform substantially below expectations. Rather than put its other businesses at risk, Gunn said, B&C decided to wash its hands of Atlantic completely. It is writing off its \$900 million investment and has turned the company over to two administrators from accounting firm Price Waterhouse.

Looking forward — not behind him

Though his name turned up on lists of the 100 richest men in Texas last year, folks around Austin remember not long ago when Bill Hayden peddled disk drives from the trunk of his orange Chevrolet Chevette.

The owner and chief executive officer of Compuadd Corp. began his mail-order business with \$100,000 that he earned from sideline real-estate deals while working as an engineer. To supplement his mail-order earnings, he drove the Chevette, full of drives, to the local high-tech firms and made a few dollars selling to engineers on their lunch breaks.

"Not getting discouraged was the hardest part," Hayden said of his 1982 lurch. "It was hard to make a living on sales of \$10,000 a month."

Hayden said he never anticipated the company becoming any bigger than \$100 million. Now, with Compuadd billing four times that, he looks for-

ward to creating the \$1 billion mark sometime in the early 1990s. "We'll never become a threat to IBM, but I would like someday for Compuadd to be worried about us," Hayden said in his soapbox tone.

Compuadd Corp. is a far loftier target than Compuadd's early archival, Austin neighbor Dell Computer Corp. "We used to compare ourselves to Dell. We don't anymore," Hayden said.

Last year, Compuadd's sales surpassed those of Dell. The growth came largely from Hayden's diversification into retailing, a channel Dell and other leading mail-order firms have eschewed.

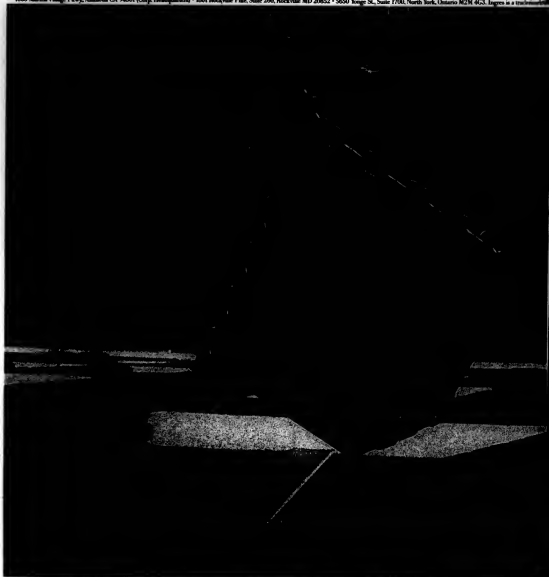
Hayden has since traded in his Chevette for a Mercedes — but the love affair lasted only nine months. "I couldn't stand it; it didn't fit my image," he said. The Texas native swapped it for a Ford Bronco.

RICHARD PASTORE



Hayden launched his career from the trunk of his Chevrolet Chevette

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SYSTEMS PROGRAMMER - Participate in the design, development, testing, implementation and documentation of batch and on-line system specifications. Require Bachelor's Degree in a Numeric Discipline and 2 years experience including IDMS DB/DC, JCL, COBOL, ADS/O, MVS/XA, CICS, TSO/VSPP and DB2. Salary \$44,000 per annum. Job Location: San Francisco, CA. Return to Rita at LUC, 101 California Street, Suite 4800, San Francisco, CA 94111.

Dr. Robinson Henson is assistant

The following is a list of the names of the individuals who are members of the Board of Directors of the company, as of the date of the filing of this report:

**Weekly.
Regional.
National.
And it works!**

Just four reasons why more companies run more recruitment advertising in *Computerworld* than in any other specialized business newspaper.

For more information or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).



Weekly. Regional. National.
And it works.

An IDG Communications Publication



UNIX/ADA PROFESSIONALS

Battelle, a leader in the field of systems engineering and systems integration, has numerous openings in the near future in key locations throughout the U.S. We are seeking experienced professionals in the near future in each of the following areas of systems specialization:

UNIX/ADA Systems Engineers - Positions require a B.S. in Computer Science or Computer Engineering, or related field, plus a minimum of 5 years experience developing embedded software using C or ADA. Successful applicants will be assigned to projects involving the development, implementation and maintenance of embedded software in both civilian and military applications.

ADA/Embedded Software - Positions require a B.S. in Computer Science, Computer Engineering, or related field, plus a minimum of 5 years experience developing embedded software using C or ADA. Successful applicants will be assigned to projects involving the development, implementation and maintenance of embedded software in both civilian and military applications.

Battelle offers competitive salaries, comprehensive benefits, and excellent opportunities for career growth. If you are interested in these opportunities, send a resume and salary history to: **Mr. J. J. Dwyer, Department 85-074, Battelle, 505 King Avenue, Columbus, Ohio 43201-2899.** An Equal Opportunity/Affirmative Action Employer M/F/V/H.

Battelle
... Putting Technology to Work

CONSULTING OPPORTUNITIES

PER DIEM OR FULL TIME/
BEST CLIENTS - BEST RATES

- *DB/PCP *RM SYS ADMS *2-WINDOWS
- *DB/COBOL *STRATUS SYS ADMS *RM WINDOWS
- *DB/OLDB *OLDB TESTERS *RM SYS PROG
- *DB/OLDB *OLDB TESTERS *RM SYS PROG
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Telemark Computer Services, Inc.
48 E. 29th St., New York, NY 10012
At: 212-686-0999 Fax: 212-686-0999
212-686-0999 212-686-0999

RCG/PROF-ACCESS, INC.
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A premier contract consulting firm is searching for

Technical Consultants

who would like to test 75 to 80% of the job site

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ROBERT HALF

Information Systems Specialists

Choosing a Star is a Matter of Knowing Where to Look.

DB2/ORACLE

PROF ANALYST
Natl contract work seeks individuals with 3-10 yrs. exp. DB2, SQL, DB/OLDB, Modeling, COBOL, and/or PL/I. Must have exp. in Oracle. Only in Atlanta & Calif. for background. Apply to: **Robert Half Information Systems, Inc.**, San Diego office for more details.
\$50-1500 **SAH100**

TELECOM ENG

Outstanding opportunity exists for you to utilize your VOICE-DATA COMM skills to design, install and maintain a new services facility. Knowledge of AT&T Systems & 675, DCS, T, LANs req. Excellent pay for growth. Full time.
\$45K **HTF100**

P/A through S/A

With solid COBOL skills and opportunities exist for you to utilize your VOICE-DATA COMM skills to design, install and maintain a new services facility. Knowledge of AT&T Systems & 675, DCS, T, LANs req. Excellent pay for growth. Full time.
\$45K **HTF100**

WORKSTATION

PROF ANALYST
Four Philadelphia area BLUE CHIP companies are expanding. Outstanding opportunity exists to acquire work with DB2, COBOL and PL/I. 2-10 years exp. in project management. DB2, COBOL, PL/I, or PL/I/SQL preferred.
\$50K **PHL100**

TANDEM

PROF ANALYST
Ground level opportunity with growing software developer firm. 2-10 years exp. in project management. DB2, COBOL, PL/I, or PL/I/SQL preferred. We are developing new products. Lots of upward mobility.
\$45K **SAT100**

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FAX (619) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Florida

Miami
\$25-45K
FAX (305) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Illinois

Chicago
\$25-45K
FAX (312) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Massachusetts

Boston
\$25-45K
FAX (617) 591-7900
San Francisco
(415) 434-1000
FAX (415) 434-0705

Michigan

Ann Arbor
\$25-45K
FAX (313) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Minnesota

Minneapolis
\$25-45K
FAX (612) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Montana

Billings
\$25-45K
FAX (406) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Nebraska

Omaha
\$25-45K
FAX (402) 296-6794
San Diego
(619) 591-7900
FAX (619) 296-6794

Nevada

Las Vegas
\$25-45K
FAX (702) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

New York

New York City
\$25-45K
FAX (212) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

North Carolina

Raleigh
\$25-45K
FAX (919) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Ohio

Columbus
\$25-45K
FAX (614) 296-6794
San Diego
(619) 591-7900
FAX (619) 296-6794

Oklahoma

Oklahoma City
\$25-45K
FAX (405) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

PROJECT LEADER

Chicago area software company seeking an experienced project leader for a 3-5 year VAX VMS project. Must have exp. in DB2, COBOL, and/or PL/I. Must have exp. in project management. Excellent pay and benefits.
\$45K **CLT100**

SOFTWARE ENG

Large national consulting firm has exciting opening for VAX/VMS applications & systems development. Knowledge of DB2, COBOL, and/or PL/I. Must be willing to work on variety of projects.
\$45K **CLT100**

LEARN DB2/OLDB

N.C. firm has immediate opening for a solid COBOL programmer with 3-5 yrs. exp. in DB2, COBOL, and/or PL/I. Must have exp. in project management. Excellent pay and benefits.
\$45K **CLT100**

PRODUCT SUPPORT ANALYST

Dallas based high-tech hardware creating CASE tool applications. Regional data base background required, especially DB2. IBM/VS Technical experience (DB2, COBOL, PL/I, or PL/I/SQL) req. DB2 req. job board number 1-4067-1102.
\$38K **DFW100**

EDP

AUDIT SUPERVISOR
Large RPT based insurance company seeks audit supervisor with 10-15 years experience. Must have exp. in DB2, COBOL, and/or PL/I. Must have exp. in project management. Excellent pay and benefits.
\$45K **NYC100**

California

Los Angeles
\$25-45K
FAX (213) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Florida

Miami
\$25-45K
FAX (305) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Illinois

Chicago
\$25-45K
FAX (312) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Massachusetts

Boston
\$25-45K
FAX (617) 591-7900
San Francisco
(415) 434-1000
FAX (415) 434-0705

Michigan

Ann Arbor
\$25-45K
FAX (313) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Minnesota

Minneapolis
\$25-45K
FAX (612) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Montana

Billings
\$25-45K
FAX (406) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Nevada

Las Vegas
\$25-45K
FAX (702) 296-6794
San Diego
(619) 591-7900
FAX (619) 296-6794

New York

New York City
\$25-45K
FAX (212) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

North Carolina

Raleigh
\$25-45K
FAX (919) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Ohio

Columbus
\$25-45K
FAX (614) 296-6794
San Diego
(619) 591-7900
FAX (619) 296-6794

Oklahoma

Oklahoma City
\$25-45K
FAX (405) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

P/C

PROF ANALYST
NY based S&P corp. seeking individuals with 3-5 years VAX VMS experience. Must have exp. in DB2, COBOL, and/or PL/I. Must have exp. in project management. Excellent pay and benefits.
\$45K **NYC100**

SOFTWARE ENG

Large national consulting firm has exciting opening for VAX/VMS applications & systems development. Knowledge of DB2, COBOL, and/or PL/I. Must be willing to work on variety of projects.
\$45K **CLT100**

LEARN DB2/OLDB

N.C. firm has immediate opening for a solid COBOL programmer with 3-5 yrs. exp. in DB2, COBOL, and/or PL/I. Must have exp. in project management. Excellent pay and benefits.
\$45K **CLT100**

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\$38K **DFW100**

EDP

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\$45K **NYC100**

California

Los Angeles
\$25-45K
FAX (213) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Florida

Miami
\$25-45K
FAX (305) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Illinois

Chicago
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FAX (312) 616-0808
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(619) 591-7900
FAX (619) 296-6794

Massachusetts

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Ann Arbor
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FAX (313) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Minnesota

Minneapolis
\$25-45K
FAX (612) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Montana

Billings
\$25-45K
FAX (406) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Nevada

Las Vegas
\$25-45K
FAX (702) 296-6794
San Diego
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New York

New York City
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North Carolina

Raleigh
\$25-45K
FAX (919) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Ohio

Columbus
\$25-45K
FAX (614) 296-6794
San Diego
(619) 591-7900
FAX (619) 296-6794

Oklahoma

Oklahoma City
\$25-45K
FAX (405) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

AS400

PROF ANALYST
Dynamic S&P based firm seeks a RPT programmer with excellent analytical and programming skills. Experience with financial and manufacturing applications a plus. Please call for further details.
\$45K **STL100**

TANDEM

Large based leading company seeks individuals with technical support exp. Min 4 yrs. working knowledge of DB2, COBOL, TAC, and/or PL/I. Must be willing to work on variety of projects.
\$45K **STL100**

SOFTWARE ENG

Large national consulting firm has exciting opening for VAX/VMS applications & systems development. Knowledge of DB2, COBOL, and/or PL/I. Must be willing to work on variety of projects.
\$45K **CLT100**

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\$45K **NYC100**

California

Los Angeles
\$25-45K
FAX (213) 616-0808
San Diego
(619) 591-7900
FAX (619) 296-6794

Florida

Miami
\$25-45K
FAX (305) 296-6794
San Francisco
(415) 434-1000
FAX (415) 434-0705

Illinois

Chicago
\$25

It's easy to place your recruitment ad in Computerworld!

All the information you need is right here. Just call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700). Or, if you want, you can send us the form below via mail or to our FAX machine. You can reach our FAX at ext. 739 or 740 at either of the above numbers.

The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4"	2"
2 columns	2-5/8"	3"
3 columns	4-1/16"	3"
4 columns	5-9/16"	4"
5 columns	6-15/16"	5"
6 columns	8-3/8"	6"
7 columns	9-3/4"	6"

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is \$14.85 per line or \$207.90 per column inch. The regional rate (Eastern, Midwestern or Western editions) is \$10.80 per line or \$151.20 per column inch. You can run your ad in any two regions for \$13.50 per

line or \$189.00 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4" wide by 2" deep) and costs \$415.80 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at \$103.95 per half inch. Box numbers are available and cost \$25 per insertion (\$50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that column (1) 418 inches wide. The ad would cost \$415.80 in our national edition, \$207.90 in the Eastern, Midwestern or Western edition, and \$131.25 in two regions, volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs:

	One Region (East/West or West)	Two Regions (East/West, Midwest/West)	National Edition
1 column x 2"	\$ 302.40	\$ 378.00	\$ 415.80
2 column x 2"	\$ 604.80	\$ 756.00	\$ 831.60
3 column x 3"	\$1,360.80	\$1,701.00	\$1,871.10
4 column x 5"	\$3,024.00	\$3,780.00	\$4,158.00
5 column x 7"	\$5,292.00	\$6,615.00	\$7,276.50

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

COMPUTER CAREERS NETWORK BUYS:

You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld's* sister newspapers at special rates. Choose from *Computerworld Focus*, *Integration*, *Network World*, *InfoWorld*, *Digital News* and *Federal Computer Week*. Call for details.

Computerworld Recruitment Advertising Order Form

Ad Size: _____ columns wide by _____ inches deep

Issue Date(s): _____

Name: _____

Company: _____

Address: _____

Telephone: _____

Region: ☐ East ☐ Midwest ☐ West ☐ National: ☐
☐ East/Midwest ☐ Midwest/West ☐ East/West

Send this form to: **COMPUTERWORLD RECRUITMENT ADVERTISING**
 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
 800-343-6474 (In MA, 508-879-0700)
 Telecopier Extensions 739 or 740



Communications Systems Programmer

San Francisco Bay Area

Kaiser Permanente, the nation's largest private health care provider, is offering an exciting opportunity in Walnut Creek, California for a dedicated communications professional with in-depth knowledge of IBM SNA network design, VTAM, NETVIEW and NCP software, IBM communications equipment, and network problem analysis.

Serving a vital role in our Communications Systems Group, you will be directly involved in planning the growth of Kaiser's data communications network to support its IBM, Tandem and DEC systems. This will include working closely with others on communications projects, resolving tough network problems, supporting management of the communications systems, as well as providing consulting support to other Kaiser organizations.

Kaiser Permanente's state-of-the-art data center is located in Walnut Creek, approximately 35 miles northeast of San Francisco. We offer a competitive salary and benefits package that includes comprehensive health/dental coverage, pension plan, tuition reimbursement and technical training. Some relocation assistance may be available. To apply, send your resume to Technical Recruiting, Kaiser Permanente Medical Care Program, Dept. CW-145, 25 North Via Monte, Walnut Creek, CA 94596, (415) 940-2657. EOE/AAE. Minorities, women, handicapped, and veterans are encouraged to apply. Principals only, please.



KAISER PERMANENTE
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CAROLINA POWER & LIGHT COMPANY, a major force in Southeastern power generation and distribution, offers information systems professionals the kind of environment that will provide long-term professional and personal satisfaction—the latest in proven technology and an appealing lifestyle. We're looking for data processing professionals to join our team and provide aggressive application development and operations support.

Along with wide use of personal computers, we're operating one IBM 5600-300, one IBM 3090-200, and one Amalaid 5690-500. The CPCL on-line environment has been growing at the rate of 40% per year. Recently, we have expanded to a new Data Center. We're operating under MVS/ESA and VM/CMS utilizing an SNA/SDLC network consisting of over 3,000 terminals and printers. Our programming languages are COBOL, SQL and DATACOM's IDEAL. We have adopted DB2 as our standard for new application development and are aggressively expanding our use of PC-based and mainframe-based CASE tools.

We have recently completed a large strategic planning study and have a significant backlog of technical and application development projects. We are currently seeking the following:

APPLICATIONS DEVELOPMENT Programmers

Positions require 4+ years of structured coding experience. Highly desired experience would include COBOL, CICS, DB2 and DATACOM. A four-year degree is preferred.

Systems Analysts

Positions require 4+ years experience in a development environment versus a maintenance environment. Highly desired experience includes structured design techniques, data modeling experience, prototyping and Method 1 knowledge. A four-year degree is preferred.

DATA ANALYST

Position requires 4+ years experience in data administration, database administration, or systems development. At least 1-2 years experience in logical or conceptual data modeling is also required, as well as experience with CASE tools. Excellent interpersonal and communication skills are essential, and JAD facilitation skills are highly desirable. Some task or project management experience is also desirable. A four-year degree is preferred.

DATABASE ANALYST

Position requires 4+ years experience utilizing a relational database engine, preferably DB2 or DATACOM/DB. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

SR. DATA COMMUNICATIONS ANALYST

Position requires 5+ years experience in data communications in a large systems SNA environment. Knowledge of PC Local Area Networks desirable. Excellent written and verbal presentation skills, as well as project management and planning experience, are a must. A four-year degree is preferred.

The quality of life in the beautiful Carolina is one on which to boast. We offer a mild but seasonal climate, a moderate cost of living, excellent schools and universities, and a myriad of cultural and recreational activities. With CP&L located in the capital city of Raleigh, the mountains and seashore are just a few hours away.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If you're interested in becoming part of our important team of professionals, send resume with salary requirements to: Randy McIlwain, Senior Recruitment Representative, Dept. CW-43999, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602. An Equal Opportunity/Affirmative Action Employer.

CP&L

Carolina Power & Light Company
Energy in Operation

RSVP SERVICES

ANALYSTS • PROGRAMMERS • HR/ISW

In a Slow Market, You Need A Quick Employment Service

If you have marketable skills, together with reasonable geographic and salary requirements, your resume will be on our file **immediately**. In our applicable contracts among our 1000+ Client Companies and 200+ Job Vacancies nationwide, almost 24 hours after we receive it. No cost obligation to you to take an interview. To apply, send your resume to:

Our clients seek 2 years minimum professional experience, ability to handle general administrative duties, and U.S. citizenship or green card. **RSVP SERVICES**
RSVP Services or call Howard Lester
Dept. C-015, 614 Cherry Hill Road, Cherry Hill, NJ 08002
800-222-0153 or FAX: 800-222-0154 (offer in Dept. C)

Charlotte
800-222-0153

Atlanta
800-222-0153

BRANNON & TULLY, INC.
1000 Peachtree Street, N.E.
Atlanta, GA 30309

BRANNON & TULLY, INC.
1000 Peachtree Street, N.E.
Atlanta, GA 30309

SENIOR TPE PROJECT MANAGER for TPE (Technical Project Engineer) position. Responsibilities include: reviewing, documenting, preparing, and managing all TPE project work. This position requires a minimum of 10 years experience in TPE project management and system engineering. The successful candidate will be responsible for the overall project management and system engineering of all TPE projects. The successful candidate will be responsible for the overall project management and system engineering of all TPE projects. The successful candidate will be responsible for the overall project management and system engineering of all TPE projects.

Systems Analyst 40 hrs/week, 8 am-5:30 pm, 2nd shift. Must have 3+ years experience in a systems analyst position. Responsibilities include: analyzing, designing, and implementing systems. The successful candidate will be responsible for the overall project management and system engineering of all TPE projects. The successful candidate will be responsible for the overall project management and system engineering of all TPE projects. The successful candidate will be responsible for the overall project management and system engineering of all TPE projects.

TO LEARN TO SUCCEED!

Are you a young man who wants to learn to succeed?

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An IDG Communications Newspaper

MARKETPLACE

Sizing up a merger's IS value

It is crucial to determine all the hidden costs of incompatible systems

BY GUY HOFFMAN
SPECIAL TO CIB

The merger mania of the 1980s has given way to friendlier acquisitions in which the overriding objectives are long-term strategic gain rather than short-term financial advantage. Still, in taking part in one of these acquisitions, executives, investment bankers and information systems professionals often overlook what is perhaps the most strategic asset of all — the information systems of the target company. They neglect it in their valuation of the deal and fail to assess the hidden costs associated with systems overlap and integration of dissimilar systems.

The upshot is that one company acquiring another one could throw out or junk the very component of the target company that made it successful.

This shortsightedness is particularly evident when it comes to communications networks, which can account for 10% or more of a company's fixed assets. In technology-driven businesses, these networks might be part of the strategic component that makes the company an attractive takeover candidate. One

of the biggest mistakes following an acquisition is to shelve the target company's network in favor of the other company's technology because of bias on the part of IS managers in the acquiring company.

Take, for example, the merger of two large Wall Street brokerage companies. The acquiring firm's technology was almost pure IBM hardware that ran under IBM's Systems Network Architecture (SNA). The acquired firm used X.25 network architecture with Data General Corp. hosts and terminals in most branches. Following the acquisition, the first thing top IS people wanted to do was unload millions of dollars' worth of Data General equipment at a price far below its depreciated value and replace it with SNA hardware that would connect to their company's massive back-office clearance system.

Ironicly, the thing that made the merger strategic was that it provided the acquiring company broad access to the retail side of the business through a nationwide network of outlets. A strategic advantage of the retail

network was its sophisticated communications network. To this day the issue has not been resolved, and the company has yet to realize the savings it anticipated from consolidating systems.

The process of assessing IS in a merger should be no different than the procedures for evaluating any other corporate function. The overriding objectives should be to identify strengths and weaknesses, select the best from each company and bring about an orderly consolidation and integration that attains the economies of scale made possible by the merger.

The first step, if necessary, is to lighten the role of the chief information officer in defining corporate strategy so that decisions are made in an active mode from the outset.

The CIO must assess the IS resources with an eye toward maximizing benefits and minimizing costs. The integration of systems often entails the following three courses of action, each more or less appropriate depending on the scale of the acquisition and the value of the sys-

tems in question:

- **Standardize on one system.** This makes the most sense when one company is much larger than the other and the relative cost of eliminating one system is negligible.
- **Maintain two distinct systems.** This option is not likely to bring about more economical operations, but it can make sense when one system can be used in departments or branches while the other serves a different function.
- **Integrate the best of both systems.** When both companies have large dissimilar systems, this alternative may be the only viable one.
- **In determining the proper course for integrating dissimilar systems, the IS infrastructure should be evaluated on the basis of the following criteria:**
 - Communications networks.
 - Local-area networks.
 - Desktop computing.
 - Applications environment.

There are any number of products on the market that help integrate disparate systems, whether at the level of applications, LANs or the enterprise. When combined, these products enable the company to employ a heterogeneous network that provides transparent interoperability among dissimilar systems. They include products to link disparate electronic mail systems, bridges and gateways to connect X.25 and SNA networks, media access control

layer bridges and routers to integrate workstation environments.

In assessing the true potential of an acquisition, it might make sense to consult with systems integrators. They can look at various components, assess the potential for interoperability and determine what steps must be taken to optimize and merge systems. Because of the biases of the two companies involved, third-party objectivity can be particularly valuable.

Careful, objective evaluation of both sides in a merger or acquisition can mean the difference between a successful melding of assets or a costly restructuring that wasn't initially part of the plan.

Hoffman is vice-president for U.S. sales and operations for ERM Technology, Inc. in New York, a manufacturer of data communications and imaging products for personal computers.

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The BoCoEx index on used computers

Closing prices report for the week ending April 20, 1990

	Closing price	Recent high	Recent low
IBM PC Model 178	\$525	\$650	\$490
XT Model 006	\$630	\$825	\$600
XT Model 009	\$900	\$900	\$750
AT Model 099	\$1,150	\$1,375	\$745
AT Model 239	\$1,200	\$1,700	\$1,200
AT Model 339	\$1,370	\$1,370	\$1,000
PS/2 Model 50	\$2,060	\$2,200	\$2,000
PS/2 Model 60	\$2,425	\$2,600	\$2,400
Compaq Portable II	\$1,475	\$1,725	\$1,400
Portable III	\$2,300	\$2,500	\$1,900
Portable 386	\$1,790	\$2,000	\$1,700
Plus	\$750	\$900	\$675
Desktop	\$925	\$900	\$800
Desktop 386	\$1,400	\$1,625	\$1,200
Desktop 386/16	\$2,500	\$2,750	\$2,475
Apple Macintosh 512	\$450	\$550	\$450
512E	\$600	\$690	\$550
Plus	\$1,200	\$1,350	\$1,200
II	\$3,300	\$3,600	\$3,000

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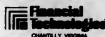
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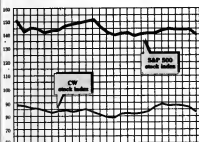
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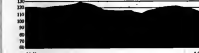
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11/1 4/2

Index	Last Week	This Week
Communications	116.5	112.0
Computer Systems	79.7	78.3
Software & DP Services	119.5	116.6
Semiconductors	55.7	54.2
Peripherals & Subsystems	82.5	81.9
Leasing Companies	96.7	87.7
Composite Index	85.9	82.9
S&P 500 Index	143.7	140.0

Communications



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Computer Systems



11/1

Software & DP Services



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Semiconductors



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Peripherals & Subsystems



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Leasing Companies



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CLOSING PRICES WEDNESDAY, APRIL 23, 1997

RANK	FIRM	52 WEEK HIGH		52 WEEK LOW		PERCENT CHG.
		PRICE	VOLUME	PRICE	VOLUME	
		APRIL 26, 1993	APRIL 26, 1993	APRIL 26, 1993	APRIL 26, 1993	
1	AMERICAN INFO TECH CORP	\$66	58	\$66.00	1.2	-1.8
2	AMERICAN TEL & TEL CORP	49	10	49.00	1.0	-4.8
3	ARTEL COM CORP	45	3	45.00	1.0	-4.4
4	AT&T	40	10	40.00	1.0	-4.4
5	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
6	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
7	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
8	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
9	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
10	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
11	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
12	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
13	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
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81	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
82	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
83	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
84	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
85	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
86	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
87	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
88	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
89	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
90	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
91	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
92	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
93	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
94	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
95	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
96	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
97	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
98	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
99	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4
100	AT&T WORLDWIDE COMM	37	1	37.00	1.0	-4.4

Computer System

[illegible]

Software & DP Services

[illegible]

Semiconductors

N	ADV MICRO DEVICES INC	11	7	8.37%	-3.4	-4.3
N	AMALGAM DEVICES INC	19	7	7.12%	-0.8	-3.4
N	ANALOGIC CORP	11	6	8.65%	0.0	6.5
N	CHIPS & TECHNOLOGIES INC	28	13	14	-1.8	-4.8
N	INTL DATA CORP	25	7	36.7%	0.0	6.5
N	CRICON TECHNOLOGY INC	26	7	11.37%	-0.1	-1.1
N	HYDROLINK INC	70	4%	67.6	0.4	-0.8
N	NATL SEMICONDUCTOR	0	6	7	0.1	1.6
N	TECHNINET INC	61	26	34.8	-1.8	-6.3
N	WESTERN DIGITAL CORP	1	3	12	-0.8	-6.3

Peripherals

ALLOY COMP	5	1	2.2	0.25	-0.2	0.5
ANALYST	1	2	1	0.68	0.1	0.0
ANALYST/RESEARCH	1	1	1	0.68	0.1	0.0
BANCAIR INC	20	11	17.7	1.4	1.4	0.7
BANK OF AMERICA	20	11	17.7	1.4	1.4	0.7
CONSUMER PRODUCTS	1	1	1	0.68	0.1	-0.3
DATA COMM	1	1	1	0.68	0.1	0.0
DATAFLOW CORP	15	8	14.5	1.1	0.8	0.5
ELC COMP/MASS	7	3	5.8	-0.8	-0.8	-0.4
ELC CORP	7	3	5.8	-0.8	-0.8	-0.4
ELWELL & BETHUNE	30	17	26.5	1.9	1.9	1.0
ENTERPRISE INC	10	5	11.2	0.9	0.4	-0.4
ENTERPRISE INC	10	5	11.2	0.9	0.4	-0.4
FIN DATA CORP	4	1	1.9	0.1	0.1	0.0
FINANCIAL CORP	4	1	1.9	0.1	0.1	0.0
GENERAL CORP	1	1	1	0.68	0.1	0.0
MACROECONOMY	7	3	5.8	-0.8	-0.8	-0.4
MANUFACTURING	1	1	1	0.68	0.1	0.0
PERSONAL COMP/PRODUCTS	5	4	4.12	0.1	0.1	0.0
PHARMACEUTICAL	13	7	13	-0.4	-0.4	-0.2
QUANTUM CORP	17	8	14.5	1.1	0.8	0.5
RESEARCH	1	1	1	0.68	0.1	0.0
REXON INC	1	1	1	0.68	0.1	0.0
SECURITY EQUIPMENT	1	1	1	0.68	0.1	0.0
STORAGE TECH CORP	35	5	34.8	2.1	0.4	0.4
TAMCO CORP	1	1	1	0.68	0.1	0.0
TELETYPE INC	34	13	24.8	1.7	0.2	0.2
TELETYPE INC	34	13	24.8	1.7	0.2	0.2

Leasing Companies

Q	AMERICAN INC	17	9	8.75	0.8	9.4
N	CAPITAL ASSOC INTL INC	8	3	3.625	-0.8	-12.1
N	CONSUMED INC	34	17	49	-8.5	-35
O	CENTRAL PAPER	1	5	0.38	0	-1.6
O	CONSTRUCTION	18	3	14.875	-6.4	-23
O	ACME MFG INC	8	3	3.375	0.0	0.0
O	PALETTING INC	8	9	8.975	0.1	2.0

EXTRA IS—NEW YORK, A—AMSTERDAM, Q—MILWAUKEE.

Rock'n'roll

*Whole lotta shakin' on Street
over high-tech's ups and downs*

Just when you thought it was safe to go back to Wall Street, those peaky earnings reports continue to shake up stock prices.

Network Equipment Technologies Corp. trembled as its stock dropped 4 1/2 points to 49 1/2 on Thursday after the company said problems with its order-taking system will negatively affect its earnings report. Panosip Systems, Inc. was in the same boat, sinking 4 1/2 points to 10 1/2 after news spread that its profits will be hurt by a revision.

A healthy earnings statement spurred QMS, Inc. up $\frac{1}{2}$ of a point to 14%. Comm Peripherals dipped $\frac{1}{4}$ of a notch to 18%.

Elsewhere, Digital Equipment Corp. lagged 5% of a point to 83% after extending its buy-back offer to five million shares. IBM slid 4% of a point to close at 108%. Texas Instruments, Inc. picked up 14 points to 34%, while rival Hewlett-Packard Co. gained 1/2 of a point to 43% after announcing that it had signed a \$75 million contract with McDonnell Douglas Systems Integration Co.

It seems that investors still haven't warmed up to the idea of the Lotus/Novell colossus. Lotus Development Corp. was down 3 points last week to 30%, while Novell Inc. fell 3% to 35%.

KIM S. NASH

For many, DOS can still do it

BY PATRICIA KEEFE
CW 25497

Perhaps one reason the multi-millions of MS-DOS users are not migrating en masse to OS/2 or Unix is that for the majority, a maturing DOS is sufficient for their needs—whether alone or coupled with a graphical windowing environment.

While some observers are inclined to dismiss the almost 9-year-old DOS as a has-been operating system, in reality, the DOS environment has been anything but stagnant.

For example, users seeking multitasking under the single-tasking DOS can choose from among several third-party products, such as Quarterdeck, Inc.'s Desqview.

As for Microsoft, it has more programmers working on DOS right now than at any other point in its history. It is currently reviewing long-term technical and support plans, according to Russ Werner, Microsoft's general manager of DOS and Windows. "We don't think that DOS should be OS/2, but we do think there is a lot we can do," he said.

Areas targeted for improvement include making DOS even smaller than the 585K-byte Release 3.3 for 640K-byte desktops and building in utilities for improving file manipulation.

The final memory model of the Intel 386 will help DOS developers, as they won't have to squeeze complex applications into the traditional 640K limitation.

One major revision

Since OS/2 was announced in April 1987, the character-based DOS has undergone one major revision, moving from Release 3.3 to 4.0. The added features include a DOS shell, support for partitions greater than 32MB on the hard disk, buffers added to the Expanded Memory Specification memory and a simpler installation program.

In addition, Microsoft introduced DOS users to a graphical user interface and context-switching through the release of Windows 3.0. September 1987, followed by the release of a 2.1 revision to both Windows 386 and 286 in June 1988.

On May 22, Microsoft is expected to unveil its *crisp de*

grace, a version of Windows 3.0—that not only will mirror OS/2 Presentation Manager, but also adds protected-mode support to DOS.

Even if OS/2 finally goes on to dominate the desktop, Windows will not simply fade away. Its minimal hardware requirements have Microsoft marketers licking their lips at the idea of a graphical, multimedia personal computer selling like hotcakes to the home user who had to settle for Pong on his Tandy the first time around.

"I would love to ride the 386SX price right down into the home, as long as for the time being we can meet corporate requirements with the required level of functionality," Werner said.

"We think [Windows 3.0] will really enhance the DOS experience for a lot of people," he added, characterizing Windows as a "tremendous extension to DOS." He said Microsoft expects that anywhere from 50% to 80% of the 40 million DOS users will move up to Windows within the next two years.

And then there's Unix

The recent failure of the Open Software Foundation and Unix International to agree leaves users with a jumble of Unix versions to pick from. This is one reason analysts said they expect OS/2 will pass Unix in sales.

Still, Unix does have some technical advantages in its support for symmetric multiprocessing and a range of chip sets. IBM and Microsoft Corp. have announced support for RISC architectures, but it is a distant goal.

On the desktop device, Unix is roughly on par with OS/2. Both will require a hardware upgrade and more complex support, and neither appears to enable any substantial new applications. Both sport graphical user interfaces. Better yet, DOS will run under Unix.

Support for Unix picks up substantially at the database level. Database developers of large system applications for OS/2 agree that Version 2.0 will be a significant tip but remain unconvinced that OS/2 is anything but another Unix alternative.

"Unix is our first priority because it allows people to work with what they already have," said Gilbert Wal, director of product marketing at Informit Software, Inc. "OS/2 will happen. But no matter how you look at it, OS/2 requires that you scrap a lot of installed systems, and there is not much of a technical reason to bother."

In fact, OS/2 loses in some comparisons to Unix, most notably in that it will not work as a server to dumb terminals without the additional purchase of OS/2 LAN Manager network software. Unix needs no systems add-ins to support terminals.

Also, OS/2 does not support symmetric multiprocessing and currently only works on the Intel Corp. architecture. The summer release of Version 2.0 of LAN Manager will feature multiprocessing support.

CHARLES W. SIMSON AND PATRICIA KEEFE

OS/2 LAN Manager to hit retail store shelves

BY PATRICIA KEEFE
CW 25497

HOUSTON—After months of denials, Microsoft Corp. last week confirmed that it will indeed enter the retail channel by shrink-wrapping the upcoming Version 2.0 of its OS/2 LAN Manager server software.

The long-anticipated decision to move LAN Manager into retail is driven primarily by frustration over LAN Manager's limited penetration in a local-area network market dominated by rival Novell, Inc.

Novell has been extremely successful with its heavy reseller orientation. Its stable of an estimated 8,000 dealers and value-added resellers has enabled it to control upwards of 80% of the desktop LAN market. LAN Manager holds only a 5% to 10% slice.

Analysts noted that LAN Manager sales have also been hobbled by problems and inadequacies with earlier versions. LAN Manager 2.0 is supposed to correct those and is expected to show in early summer—three months late.

The push into retail won't happen immediately; the actual launch is slated for July. Mike Murray, general manager of Microsoft's Network Business

Unit, is hoping to sign up 500 to 600 resellers by year's end.

At the same time, rather than duplicate efforts, Compaq Computer Corp. simultaneously announced that it was dropping plans first announced in November 1988 [CW, Nov. 13] to similarly distribute a version of LAN Manager tailored to its platform.

A retail presence could assist all LAN Manager sales by visibly linking Microsoft's name with its own creation, analysts said.

Going the OEM route was also a great marketing *faux pas*, said Mark Freund, a principal with Interconnect, a Pasadena, Calif.-based network consulting firm.

"Microsoft was successful in creating an interest in LAN Manager but incredibly unsuccessful in creating a means for anyone to find it," he said.

"Customers postponed buying LAN Manager because they didn't believe we were serious about it," Murray agreed.

A core server product could also attract those users by offering an alternative to OEMs' hardware-specific versions, said Craig Burton, a former Novell executive who is now editor of the "Clarke Burton Report." "Microsoft must provide a product that... gives users freedom of choice," he said.

OS/2

FROM PAGE 1

Corp. in San Francisco. "If you really look at an end-user function, most things are pretty easily done with Windows. The real issue [with OS/2] is in production (business operations) applications."

So despite the millions of dol-

Ramp-up route

A June 1989 survey of 100 large IS operations found only 18% currently running OS/2, and most of these indicated usage was relatively minor.



Source: Business Research Group
CW Chart: John York

lars invested in development, it is obvious that Microsoft's end-user Bill Gates' November 1989 boast of shipping one million units of OS/2 by the end of 1990 will not pan out. According to Microsoft, it has shipped approximately 300,000 copies of OS/2; industry analysts pegged that number closer to 200,000.

"Our early expectations [for the success of OS/2] were incorrect; we did not do ourselves or the industry a service by setting those expectations," conceded Paul Maritz, Microsoft's vice-president of advanced operating systems. "We should have realized that moving from DOS is a multilayered decision that takes five to seven years to do."

In the mean time, the biggest thorn in OS/2's side is shipping up to the competency of 50 million DOS users, many of whom appear content to sit out at least part of the coming decade of technological advancements.

A resilient DOS is definitely here to stay, abetted in large part by the Windows interface to the seven-year-old operating system. The latest version, Windows 3.0, is an indication that DOS will do OS/2 success throughout the next five to seven years (see story above).

"I simply don't see a need to get to OS/2 anytime soon outside our point-of-sale applications," said Richard Dykes, MIS director at Williams-Sonoma Co. "There is plenty of room in Windows to satisfy all of our end-user needs."

This is not to say that OS/2 is

not making headway, because it is. The gradual drift of user migration to OS/2 has been accelerated the first stages of a form of global warming.

There is a cadre of power users and network managers who are thirsting for a speedy, memory-rich, multitasking environment. Early adopters who have made a substantial commitment to OS/2 include BankAmerica, United Airlines, Corvia Corp., Eastman Kodak Co. and Kentucky Fried Chicken Corp. (see story page 119).

However, it is not the personal productivity or office automation needs that are driving a growing interest in OS/2. It is the business application side of the house—which typically involves long-range strategic planning, longer sales cycles and complex, long-term development projects—that is investing in OS/2 for enterprise-wide data access and connectivity.

A networked generation
Many of the 300,000 OS/2 units have gone to corporate and commercial developers and will be used to seed a generation of networked, mission-critical applications, according to Maritz. The reason it has taken so long is that users such as Bob Spicer, IS director for Chevy Chase Bank in Baltimore, Md., could not justify the expense of moving to OS/2 for anything less than a core business application.

To serve that need, most of these users are running OS/2 on the server. As a result, sales of

OS/2 fever is burning slowly but strongly

BY PATRICIA KEEFE
and CHARLES VON SIMSON
OF ENVI

Where OS/2 is running today, its full benefits are typically more planned than real. There are, however, some sites that have begun to take advantage of the features that OS/2 proponents believe will guarantee its success.

At Bankamerica Corp., a high-profile plan to install 10,000 OS/2 bank officer workstations is still only a statement of direction; few of the systems are actually running. At the same time, a production application running in the bowels of the bank is demonstrating where all the interest in OS/2 is coming from.

Using OS/2, the bank has tied its cash-counting machines into the accounting system automating a group over a local-area network. The multithreading capability of OS/2 allows the system to continue counting the incoming bills while starting another logical

thread to update the appropriate account. While such a system might have been possible under Unix, Bankamerica developers found OS/2 a much simpler, more easily compatible solution.

The coming wave

A January survey of 162 users with more than 400 PCs installed showed that OS/2 will have been adopted by more than 40% of the respondents within two years.



Source: Data Source: C. W. Chart: David D. Co. Copyright: C. W. Chart: David D. Co.

IBM's OS/2 Extended Edition have outstripped OS/2 Standard Edition, Maritz conceded last week. "If you look where OS/2 is a success, it's in the corporate distributed environment," he explained.

"The people who really need OS/2 today for their applications are a very specialized class," Myhrvold said. "They are not Dbase IV and Wordperfect, they are things like Informix and [Integrus Corp.], McCormack & Dodge, Interleaf, SAS. The database server guys can see the most benefit from the 32-bit applications."

Maritz projected it will be two to three years before Microsoft sees big-volume OS/2 sales, which is why more and more developers are jumping on the Windows bandwagon. While that may be OK with Microsoft, developers such as Lotus Development Corp., Wordperfect Corp. and Software Publishing Corp. have complained long and loudly about Windows' expense and the lack of support from the specs of OS/2.

Stung by such criticisms and paralyzed sales, IBM and Microsoft teamed up in November to issue a declaration of unity: no more separate tool kits, no more divergent local-area network servers and no more fighting over Windows. Five months later, however, not only is there little visible evidence of a synchronized OS/2 strategy, but both vendors recently reverted to character by endorsing separate forms for Presentation Manager. IBM and Microsoft have con-

sistently argued that OS/2 will win adoption as a client system once the required hardware configuration becomes standard on most personal computers shipped by the end of 1991.

The entry-level platform for OS/2, and some said for Windows 3.0 as well, is an Intel Corp. 80386-based PC equipped with 3M to 4M bytes of random-access memory and a 30M-byte hard drive. But it will be several years at least before the installed base of 286-based systems is replaced.

Tough decisions

Corporate users are struggling to decide whether it is truly cheaper to use Windows as a stepping-stone to OS/2, whether they should upgrade their 286s with added memory, or whether it is better to spend the money on new 386s.

Further confusing the issue is the fact that Windows 3.0 mirrors OS/2 Presentation Manager's interface, according to reports from enthusiastic beta testers.

"PM Lite lives," quipped Rick Segal, a technical advisor at the Aetna Casualty Co. in Hartford, Conn. PM Lite was the company's first choice for a purpose-built IBM/Microsoft plan to develop a scaled-down version of Presentation Manager as a way of easing DOS-to-OS/2 migration.

Widely touted as the interface that finally pulls the PC into the Apple Computer, Inc. Macintosh, Windows 3.0 should

At Kentucky Fried Chicken Corp., OS/2-based point-of-sale systems will go into 1,300 company-owned stores this year. Multithreads, expanded memory and enhanced local-area networking capabilities will enable information to move within the store and back to corporate headquarters in ways truly impossible under DOS.

"OS/2 is key to our infrastructural plans, and we simply didn't see a solution as solid anywhere else," said Monte Jones, MIS director at Kentucky Fried Chicken.

Most typical of companies looking for a payoff from OS/2 in the future is The Equitable in New York. Robert McNulty, vice-president of technical management and operations, currently has about 100 OS/2 clients but plans to roll out between 6,000 and 8,000 over the next two years.

The first Equitable OS/2 systems will be deployed on OS/2-based LANs connected to mainframe databases that will provide customer service information to customers calling in.

"When we first looked at a \$10,000 workstation for customer service rep, we really felt that it was prohibitive," said McNulty. But he took a closer

look at the total cost of another migration three to five years out, the direction of IBM's Netview and the ultimate ability to manage LANs remotely, and decided that in order to stay close to IBM, he may as well "bite the OS/2 bullet."

While users like McNulty supported the Microsoft view that OS/2 is a natural migration from DOS, others saw Windows as a way to minimize risk and make the wait for OS/2 features and applications more comfortable.

Danny Mueller, an assistant vice-president of Merrill Lynch & Co.'s Investment Banking Group, said he feels there is more functionality that is stable and currently available under a graphical DOS. He said he also believes the cost of migrating to Windows is much smaller. Moreover, Mueller said, Windows 3.0 "will provide even greater functionality that will extend the life of our DOS applications."

Staff writer Sally Cusack contributed to this report.

List less

Microsoft Corp. estimates that there are about 600 OS/2-based software packages shipping today; however, only a small fraction of those applications support OS/2 Presentation Manager's graphical user interface. Conversely, there are about 20,000 applications available for DOS, an estimated 700 of which support Windows. The following is an abbreviated list of OS/2 Presentation Manager applications:

- IBM — OfficeVision/2.
- Microsoft — Excel spreadsheet.
- Lotus Development Corp. — 1-2-3-G and Notes groupware.
- Aldus Corp. — Pagemaker.
- Autodesk, Inc. — AutoCAD.
- Oracle Corp. — Oracle Server.
- Microgrids, Inc. — Designer PM desktop publishing.
- Describe, Inc. — Describe WYSIWYG word processor.
- SPSS, Inc. — SPSS Statistics.
- Polarix Software — Polarix personal information manager.

Kentucky Fried Chicken, where the 386SX microprocessor is already the minimum standard.

Yet despite the much-lamented lack of OS/2 applications, which is expected to abate considerably this year, a large number of users are not holding out for OS/2 versions of their favorite programs. Some, like Segal, are waiting for a new application, one that they cannot do now. Still others are waiting the arrival of a 32-bit OS/2.

What they want is OS/2 Version 2.0, which will allow them to run multiple DOS applications and fully exploit the 386 chip. When it ships, OS/2 Version 2.0

will support 32-bit applications and the 386's flat memory model, pulling the operating system into the range of larger system environments such as Unix.

However, until users can or choose to take advantage of those future capabilities, it appears that OS/2 is destined to remain both a niche desktop platform for the foreseeable future and a server operating system that enjoys pockets of strength in an extended battle with Unix. In the longer term, OS/2 will become a standard alongside DOS, thanks in part to enhanced memory support.

Staff writer Sally Cusack contributed to this report.

Stepping-stones

August 1985 — Microsoft Corp. announces an agreement with IBM for development of operating systems.

April 1987 — OS/2 and Presentation Manager announced.

June 1987 — Release of OS/2 Software Development Kit.

October 1988 — Microsoft ships OS/2 1.1 with Presentation Manager.

January 1989 — Microsoft says lack of OS/2 applications are reason for sluggish OS/2 implementation.

May 1989 — Microsoft announces OS/2 1.3.

September 1989 — OS/2 Standard Edition 1.2 and OS/2 Extended Edition 1.3 are shipped.

October 1989 — Microsoft ships Microsoft Excel for OS/2.

January 1990 — The Software Publishers Association announces that applications for OS/2 increased 347% in 1989 over figures available for 1988.

SALLY CUSACK

NEWS SHORTS

Bellcore tests multimedia

An experimental system for filtering multimedia information from networks will be demonstrated next week by Bellcore, the research and development arm of the seven regional Bell holding companies. Bellcore said it is using its Customized Information Delivery software to evaluate how public networks might handle different types and volumes of information traffic. A prototype will be shown at the Information Industry Association conference in San Francisco, where Bellcore will also showcase its Videowindow teleconferencing system and its Criterion interface videoconferencing setup.

Ben bureaucrats, says auto group

Automotive Industry Action Group (AIAG) officials have urged the federal government to avoid establishing "a new bureaucracy" to oversee standards development for electronic data interchange, bar coding and other technologies. Instead, at a recent National Institute of Standards and Technology hearing, the AIAG asked the government to join with industry and education in a partnership alliance. The subject of the hearing was U.S. participation in international standards activities. John C. Martin, managing director of AIAG, said a single standards authority is not likely to work as well as a voluntary process. AIAG standards produced by open participation are in use daily by more than 3,000 North American firms.

HP plans system software

Following up its January announcement of mainframe-size hardware, Hewlett-Packard Co. plans to announce this week system management software for its high-end computers. Replicated Site System Management software will allow "total operator independence, with the possible exception of someone sitting in a tape," Robert Hill, marketing manager for the HP 3000 series, said at a recent user group conference. HP last week would not comment on the software, but an analyst who had been briefed by HP confirmed it will be announced this week.

MCI: Don't call home without us

MCI Communications Corp. last week announced a three-year, nonexclusive agreement by which it will provide data, messaging and voice network services to American Express Co. units worldwide. With a two-year option, the deal could be worth up to \$100 million, MCI said. MCI will provide service to American Express Travel Related Services Co., American Express Information Services Co., American Express Bank, Shearson Lehman Futton, Inc. and IDS Financial Services.

'Architecture' is word for the day

The trend toward vendors offering software architectures is accelerating. In addition to major hardware and software vendors, industry-specific software suppliers are getting into the act. Systemsics, a Little Rock, Ark.-based provider of software and services for the financial industry, last week unveiled an architecture of its own that it said will dramatically reduce the time needed to develop applications. Dubbed *Extended Application Architecture*, the framework builds on IBM's *Systems Application Architecture* blueprint. In addition, the firm announced *Advanced Lase System* for major lending institutions, the first financial application that takes full advantage of the architecture, to be available in June.

AT&T, France Telecom demo ISDN

AT&T and France Telecom last week announced that the first international Integrated Services Digital Network (ISDN) services between the U.S. and France will begin next month. The carriers demonstrated the service with a videoconference between Paris and AT&T's New Jersey offices. The service links AT&T and France Telecom's public networks at ISDN's 64K bit/sec. per-channel speeds. ISDN allows the simultaneous transmission of voice, data and video over a single line on switched basis, so users pay for bandwidth only as they use it.

Benhamou bests rivals for 3Com presidency

BY JIM NASH
OF STAFF

Information systems professionals and analysts last week expressed some surprise but little concern over 3Com Corp.'s decision to hand day-to-day control of the networking company to Executive Vice-President Eric Benhamou.

Little, if any, change in 3Com or its user policy is expected to come with the ascension of Benhamou to president and chief operating officer of the Santa Clara, Calif.-based firm. In 1981, Benhamou co-founded Bridge Communications, a networking company that merged with 3Com six years later. He has since served as general manager of 3Com's software products and distributed systems divisions.

"It sounds like a good move," said Allan Schwelb, senior network analyst at Uno-Ven Co., a subsidiary of Unocal Corp.

Schwelb said that he personally had little faith in the networking company of late. He experienced problems with 3Com's Massex gateway shutting down the network repeatedly at a health-care company at which he worked last year, he said, and the confusion and turnover in 3Com's service department compounded the problem.

Schwelb said his present company uses 3Com adapter cards and has had no problem with those.

Clark Lambert, director of data processing at *The Kanas* City Star, said that he separates corporate shifts from product performance.

"I look at [networking products as] a consumable," Lambert explained. He uses 3Com adapter cards in desktop systems for Ethernet taps. Those cards work well, he said, and as long as they perform, he will continue buying 3Com products.

Benhamou had been vying with two other 3Com executives for the presidency since last fall, when the networking company's management structure was overhauled.

Benhamou's promotion appears to alter little in the competitive bid to consolidate control over day-to-day activities. "I look forward to being chairman for life," said Chief Executive Officer and board Chairman Bill Krause, who did not comment on how long he will remain CEO.

The promotion comes less than a month after a planned merger between 3Com and Ech-

elon Corp. unraveled. Had the merger been completed, according to an unrelaxed news announcement obtained by *Computerworld*, Echelon CEO Ken Osburn would have named 3Com's helm [CW, April 9].

Krause, who had denied that the threatened merger ever existed, refused to comment on whether the new management shift was a fallback position.

The other candidates were Executive Vice-Presidents Lou Demond and Bob Finocchio. They, along with Benhamou, had formed a triad and acted collectively as 3Com's COO. Demond will assume Benhamou's product operation duties. Finocchio, executive vice-president of field operations, will continue in his current assignment.

The 34-year-old Benhamou said his first priority as president and COO will be to continue pushing the company's "Renaissance Plan." Announced last December, the plan calls for significant internal and external realignment of the company.

Bob Mendenhall, founder of 3Com and a board member, commended Krause's handling of the promotion.

"Changes in leadership are usually bloody," he said. "I feel pretty good about how this one went. Bill's doing a super job of negotiating it."



Benhamou's appointment was a surprise.

DG, Wang paint quarter red

BY MAURA J. HARRINGTON
OF STAFF

While some U.S. computer vendors find relief abroad from the computer industry slump, Data General Corp. and Wang Laboratories, Inc. continue to stumble in the West.

Westboro, Mass.-based DG and Lowell, Mass.-based Wang each registered significant losses for the quarter ending March 31. DG reported an \$8.6 million net loss for its second quarter, compared with an \$7 million profit reported for the second quarter of 1989. Revenue of \$314.8 million for the second quarter of 1990 was down 8.2%.

Meanwhile, Wang's third-quarter results showed a worse-than-anticipated loss of \$14.6 million, compared with a loss of \$63.7 million for the third quarter of 1989.

The latest loss included several one-time nonoperating charges resulting from debt-reduction programs designed to eliminate Wang's interest expenses and its bank group debt, reported at \$75 million last year and now at \$65 million.

At Xerox Microsystems, Inc.

and Compaq Computer Corp., however, business is up, fueled by strong international sales.

Sun reported third-quarter revenue of \$632.2 million, up 27% over the corresponding quarter a year ago. Earnings for Sun were \$36.7 million, an 18% increase over last year.

Sun President Scott McNealey said he expects the global market, which made up 53% of Sun's third-quarter revenue, to continue to play a large part in the company's financial future. The do-nothing sector, he said, will exhibit only "modest growth at best" in the upcoming quarter.

Compaq announced that sales for its first quarter rose to \$872 million. Income reached \$92 million, rising 11% compared with net income of \$83 million in the first quarter of 1989.

Michael Sweeney, president of Compaq North America, attributed the 28% increase in sales over the first quarter of 1989 to a higher-than-expected sales growth for business outside North America, which accounted for 56% of the quarterly revenue, while North American sales were up only slightly, rising 4% over the first quarter of 1989.

Novell stock sales 'normal'

Coincidence is the way Novell, Inc. officials are explaining stock sales by key executives shortly before plans to merge Novell and Lotus Development Corp. were announced. Novell said prices plunged on news of the merger.

A spokesman for Novell confirmed that Chairman Ray Noorda, corporate general counsel David Bradford and two other employees sold blocks of stock worth more than \$8 million, less than one month before the merger plans were made public.

The spokesman said internal policies and U.S. Securities and Exchange Commission rules force company insiders to trade stock in "small windows of opportunity."

He explained that because of Novell's merger with Excelan, Inc. last June and the release of quarterly earnings reports, employees who wanted to sell their shares were required to do so in March.

Noorda sold 153,000 shares, or 4% of his holdings, on March 19 and 20 for a reported \$6.6 million.

Ingres unveils graphical 4GL

Ingres/Windows/4GL speeds building of point-and-click applications

BY JEAN S. ROZMAN
CW STAFF

ALAMEDA, Calif. — Ingres Corp. took the wraps off what has commonly been called its "Sapphire" software last week, demonstrating a fourth-generation language that develops point-and-click applications for workstations.

Ingres/Windows/4GL is designed to speed applications development by value-added resellers (VAR) and end users alike, product manager Bill Smith said.

Initially, it will be available for Sun Microsystems, Inc.'s Scalable Systems Architecture-powered workstations; under the OSF/Motif user interface, and on Digital Equipment Corp. VAX computers running VMS

and Decwindows.

Shipments of these first versions are slated for September. Later versions are planned that will support Hewlett-Packard Co. workstations. The Santa Cruz Operation's Open Desktop and AT&T and Sun's Open Look graphical user interface.

Up until now, Ingres data has been presented mostly on character-based screens. "We had to take a lot of heat in the marketplace because we didn't support a development environment in the X Window environment," Smith said.

Industry analysts briefed on the product seemed impressed with its flexibility. "It looks like

no one vendor will win the [graphical user interface] battles," said Peter Kastner, vice-



Ingres/Windows/4GL gives graphical interface to menu-driven software development

president at Aberdeen Group, a Boston market research company.

Kastner said the Ingres 4GL would enable information systems departments and VARs to reduce their programming time and simplify the task of adapting existing applications for use on workstation platforms.

Ingres/Windows/4GL is being priced at 35% of the cost of the base Ingres relational database management system product. For minicomputer users, that could spell a heavy price tag, but workstation users should fare better. Buying the product for an eight-node local-area network of Sun workstations would cost about \$4,000, Ingres said.

Ingres/Windows/4GL stores its data in Ingres RDBMS itself, but future versions of the product will support other DBMSs as long as there is a gateway between Ingres' and the other vendors' databases.

Some beta-test users plan to deploy the Windows/4GL product as soon as they get production code this fall. "As soon as we can put the workstation devices on our scientists' desks, we would like to give them the applications that allow them to manage their lab data," said Don Mattes, system architect in the application development group of SmithKline Beecham Corp. in King of Prussia, Pa.

Smithkline, a pharmaceutical firm, has used the Ingres RDBMS for four years, Mattes said, primarily on a Vaxstation containing eight DEC VAX 8700s and several smaller VAX machines. Until now, much lab work has been done with character-based DEC VT100 and VT200 terminals. Ingres Application by Forms development tool, Mattes said. "Using this new Windows-based Ingres product, we can write simpler applications and let scientists navigate through their data on their own," he said.

Atlantic

FROM PAGE 1

the final years of the leasing agreement.

Under the flex format, the user signs two agreements: a longer-term agreement discounted to a bank, which finances the equipment and collects the payments, and a shorter-term contract with the lessor, providing that at one or more "flexpoints," the user can upgrade its leased machinery and the lessor will take back the hardware and pay off the bank.

The two-contract Flexlease format could leave Atlantic users "in a bit of a tricky position," said Lucia Dore, editor of London-based *Leasing Digest*. If Atlantic-based under Dore said, "in the worst-case scenario, the leases [with the bank] are still valid, but the flexpoint can't be exercised" because one of the parties to the short-term balloon lease won't be around to bail the user out. "The customers could be trapped," she added.

"I think you'll see a quiet outcry from users" who will be stuck with potentially underused technology for the remaining lengths of their leases, said Timothy K. Ozark, presi-

dent of The Meridian Group in Deerfield, Ill.

Atlantic users, Ozark said, face a situation in which the fair market value of their installed equipment may be substantially less than their remaining obligation to Atlantic or to the secured lender. Some of these customers, Ozark recommended, will be better off writing down their obligation now, possibly trading up to a more powerful computer and signing up for a standard three-year lease.

Shift pending

If Atlantic Computer fails, it could disrupt the results of U.S.-based computer leasing firms

Company	Annual revenue 1990 survey
1 GE Capital	5.9B
2 AT&T Capital Corp.	3.1B
3 Comdisco, Inc.	1.6B
4 Bell Atlantic Capital Corp.	1.4B
5 Concord Leasing, Inc.	1.0B
6 Chase Manhattan Leasing Co.	1.0B
7 United Leasing Corp.	711M
8 Banc Boston Leasing Co.	692M
9 Uniles Finance Corp.	635.5M
10 The Meridian Group	562.8M
11 Atlantic Computer Systems	468M
12 Banc One Leasing Corp.	424.6M
13 Hewlett-Packard Co.	350M
14 First Fidelity Bank NA	202M
15 Master Lease Corp.	200M

Information assembled by creditanalysts IBM Credit Corp.

Source: Annual Finance & Leasing Digest

CW Chart: Steven Drake

Since learning April 16 that its parent company had been cast into the UK equivalent of Chapter 11, the firm that recently had 278 employees has pared itself virtually out of existence.

On April 16, Chief Executive Officer Philip Hold was abruptly replaced by the firm's corporate counsel, Vaughn Duff. The firm has issued no statement explaining the circumstances of Hold's departure, and officials could not be reached for comment.

On April 20, the firm reduced its staff to approximately 49 people.

On April 24, it confirmed the closing of its lease origination business and 10 sales offices. Duff, in a prepared statement, said the fall of Atlantic PLC, which recently issued a healthy 1989 earnings report, "came as a complete surprise to everyone in the U.S." He conceded that a Chapter 11 filing might be in store for the U.S. subsidiary but stressed it was not yet necessary and urged the firm's creditors to aid him in liquidating Atlantic Com-

puter's assets without court intervention.

By week's end, rumors were rife that Atlantic was already sacrificing off pieces of its portfolio, which is largely made up of IBM computers but also contains offerings from Digital Equipment Corp., Cray Research, Inc. and Amdeco Corp.

The sudden dissolution of another contender is unlikely to prove disastrous to the leasing sector, which is acclimating and reeling from the 1989 bankruptcy of its second largest player, not to mention the unsettling effects of the advent of well-

heeled and aggressive IBM Credit Corp. (see story below).

"Any time one of the large players goes under, other companies get nervous, customers start to get nervous and the sharks move in," said Sandy Bowers, a leasing industry analyst at San Jose, Calif.-based research firm Dataquest, Inc.

If customers are sufficiently scared, the sharks may not get a chance to make the first move. Last week, both Kenneth N. Pontikes, president of Comdisco, Inc. and Ozark said that they were fielding calls from Atlantic customers.

A closing chapter

When James Hammett addressed the movers and shakers of the computer leasing industry at the annual gathering of its major industry association this Friday, none of the moving and shaking may look more like nervous ticks than power strokes. The "inherent problems" of the U.S. computer leasing business, he said last week, are "getting consistently worse, not better."

Hammett is now overseeing the efforts of Continental Information Systems Corp. (CIS) — once the industry's second largest independent player — to reorganize under Chapter 11.

In addition to the problems of the computer industry in general, the leasing niche has had its own particular corner to bear: the onslaught of IBM Credit Corp. IBM's captive leasing unit is currently writing better than 50% of all domestic computer leasing business, according to Thomas Dawson, director of financial strategy at Framingham, Mass.-based Technology Investment Strategies, Inc.

Leading independent lender Comdisco, Inc. has reduced its reliance on IBM loans to less than 50% of its domestic business. President Kenneth Pontikes said, nevertheless, Comdisco would earlier this month that profits would be off 30%.

"The programs for going to," Dawson said, "are not consistent. What you're going to see is a market dominated by large companies leasing equipment and captive leasing subsidiaries."

However, Kenneth Reardon, president of the Computer Dealers and Leasing Association, disagreed. "The deals haven't really worked," he noted, pointing to CIS and Atlantic Computer as prime examples.

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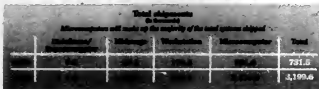


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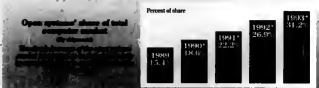
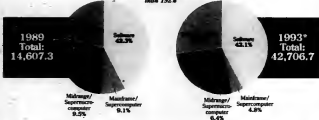
TRENDS

Open X Systems

Pressure from the user community is forcing manufacturers to shy away from proprietary architectures and look more toward open standards. This gives vendors two options: Research and develop now and lead the industry, or be led by the competition later.



Market share by revenue
In three years, revenue for open systems is expected to increase more than 192%



*Projected

Source: Electronic Trends Publications, Syracuse, Calif.
CPI Client Time Magazine

NEXT WEEK

Until recently, Williams-Sonoma ran its mail-order and retail businesses on separate systems. All that is changing under Vice-President of MIS Richard Dykes, whose mandate is to integrate the systems and enable both businesses to grow without adding employees. Manager's Journal examines specialty merchandise chain.



Accounting software has traditionally been considered the solid, unmovable foundation of a company's automated systems. That image is now changing as people see access to financial systems as the key to executive-level decision making. To see how fast developers have to step to meet user demands, turn to Product Spotlight.

INSIDE LINES

We need an architectural consultant

The '90s are open to us and to our great blueprint. Computer Associates, of course, is firmly installing its "CA Win" strategy in New York. Next week, also in New York, Anderson Consulting will unveil Foundation '90, its computer-aided software engineering strategy for the '90s, pushing Foundation onto new platforms — including OS/2 support — and rolling out also new products.

Dial-a-guinea pig: 1-800-.....

The software that caused AT&T's networking snafu last January was not ready for production when it was installed because it had not gone through the carrier's quality assurance and testing procedures, a *Computerworld* reader reports. His source is a consultant who reportedly was working at AT&T's New York control office also when the problem arose. "You might call it an error in judgment," our source bluntly suggested. AT&T customers whose switched connections and 800 numbers were blown out for hours would no doubt agree.

OSF: Outracing Sun Forever

On May 15, the Open Software Foundation will announce the selection of a distributed computing environment aimed at facilitating interoperability between Unix and non-Unix systems. Most observers believe that Decima, a joint collaboration by IBM, Hewlett-Packard and others, is a shoe-in. Sun Microsystems seems to agree and plans to head off the move with a promotional tour starting next week for its Open Network Computing technology based on Network File System.

Bring in the name squad

Lotus recently treated attendees at an OS/2 pep rally to a special product — under the name of, of course, of Chagall, a business graphics package that runs under OS/2. Industry speculation pegs Chagall as a revamped version of ProDraw. No word yet on a delivery date, but we figure it must be this year if Lotus is trotting it out to users.

Wouldn't it be nice

Russ Werner, who heads up DOS and Windows development at Microsoft, says the firm wants to get down to shipping only one version of DOS for Intel 80386- and i486-based computers. Paul Martin, Microsoft's vice-president of advanced operating systems, harbors similar thoughts about OS/2. He wants to get OS/2 and IBM in sync with their shipments of OS/2, and he is also projecting a move, probably welcome, toward a 12- to 18-month lag between new OS/2 releases.

No tolerance for competition

Hitch Ltd. plans to enter the non-stop computing business soon with the launch in Japan of a fault-tolerant computer. The big plug-compatible mainframe has watched steadily as U.S. companies like Tandem, Digital Equipment and IBM, which OEM's Stratus machines as the System/36, make inroads into the local midcomputer market. Fujitsu is rumored to be preparing to unsway a fault-tolerant system as well.

They just don't get it

Novell, the Provo, Utah-based networking company, once no problem with mounting periodic morale and awards before shipping and sometimes even before testing. But no more the frustration of LAN managers, Novell insists it is not premature, period. However, mid company spokeswoman Jan Johnson, Novell is trying to "shorten the gap" between news of a product and actual availability.

Spawning OS/2 and DOS: An IBM sales representative reportedly took one look at a Windows 3.0 demo and expressed an PC as access recently at The Dallas County and City of Dallas Co. in Northport, Conn., and remarked, "If you're running OS/2 with Presentation Manager, I can tell you the difference. Windows would either be the next successful transition possible to OS/2 Presentation Manager or reason enough for not taking the higher road. We're always in the market for what's next in the OS/2 world, so contact them about this. Send us a fax at 617-481-1000, or call 617-481-4811 or address IBM Direct Computing World."

a good idea. But all the other parts of the system. Why not to use it? It's a simple database that reduces the overhead of a system. A

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